

VOLUME 323

NUMBER 2, PART 3

THE ASTROPHYSICAL JOURNAL

1987

ANNUAL AUTHOR AND SUBJECT INDEX

TO VOLUMES 312-323 PARTS 1 AND 2
AND
TO THE SUPPLEMENT SERIES
VOLUMES 63-65

PUBLISHED BY THE UNIVERSITY OF CHICAGO PRESS FOR
THE AMERICAN ASTRONOMICAL SOCIETY

Single Copy: \$5.00

-

3

7

1

VOLUME 323

NUMBER 2, PART 3

THE ASTROPHYSICAL JOURNAL

1987

ANNUAL AUTHOR AND SUBJECT INDEX

TO VOLUMES 312-323 PARTS 1 AND 2
AND
TO THE SUPPLEMENT SERIES
VOLUMES 63-65

PUBLISHED BY THE UNIVERSITY OF CHICAGO PRESS FOR
THE AMERICAN ASTRONOMICAL SOCIETY

Single Copy: \$5.00

© 1988 by The American Astronomical Society. All rights reserved.
Printed in U.S.A.

Compiled by the staff of *The Astrophysical Journal*, processed and encoded for typesetting by a series of computer programs developed by Robert A. Fox; typeset by Science Typographers, Inc., Medford, New York, and printed by Capital City Press, Montpelier, Vermont.

CONTENTS

	<i>Page</i>
AUTHOR INDEX	1
SUBJECT HEADINGS	77
SUBJECT INDEX	81

1
2
3
7

1

1987 ANNUAL INDEX

AUTHOR INDEX

- AARONSON, M. Isophotal Diameters of Cluster Spirals. *M. E. Cornell, M. Aaronson, G. Bothun, and J. Mould.* **64**, 507, 24-A5 (1987) (Abstr. in **317**, 1002, 77-B5)
- AARONSON, MARC. The Use of the Brightest Blue Supergiants as Distance Indicators—Further Complications; OR The Brightest "Stars" Are Not Always Stars. *Roberta M. Humphreys and Marc Aaronson.* **318**, L69, 92-C14 (1987)
- ABBOTT, DAVID C. The Discovery of Nonthermal Radio Emission from Magnetic Bp–Ap Stars. *Stephen A. Drake, David C. Abbott, T. S. Bastian, J. H. Bieging, E. Churchwell, G. Dulk, and Jeffrey L. Linsky.* **322**, 902, 149-F10 (1987)
- ABDELATIF, TOUFIK E. The Interaction of Solar p -Modes with a Sunspot. II. Simple Theoretical Models. *Toufik E. Abdelatif and John H. Thomas.* **320**, 884, 119-D11 (1987)
- Heating of Coronal Loops by Phase-mixed Shear Alfvén Waves. *Toufik E. Abdelatif.* **322**, 494, 143-D1 (1987)
- ABRAHAM, Z. Evolution of 3C 273 at 10.7 GHz. *M. H. Cohen, J. A. Zensus, J. A. Biretta, G. Comoretto, P. Kaufmann, and Z. Abraham.* **315**, L89, 49-B11 (1987)
- ABRAMOWICZ, M. A. A New Example of the Papaloizou–Pringle Instability. *M. A. Abramowicz, M. A. Blaes, and P. Ghosh.* **323**, 629, 161-E10 (1987)
- ABT, HELMUT A. Editorial: Publication Times and Volume Indexes. *Helmuth A. Abt and A. Dalgarno.* **315**, L71, 49-A9 (1987)
- Implications for Solar-Type Binary Statistics of the Morbey–Griffin Improved Binary Analysis. *Helmuth A. Abt.* **317**, 353, 67-F11 (1987)
- Duplicity among Stars with Strong Chromospheric Ca II Emission Lines: A Statistical Survey. *Arthur Young, Richard A. Mielbrecht, and Helmut A. Abt.* **317**, 787, 74-F1 (1987)
- The Binary Frequency of High-Velocity Field Dwarfs as Obtained with CCD Measures. *Helmuth A. Abt and Daryl W. Willmarth.* **318**, 786, 89-E1 (1987)
- Editorial: Subscription Rate Increases. *Helmuth A. Abt.* **321**, 1, 122-A7 (1987)
- Announcement: Availability of a Current Index to the *Astrophysical Journal* and *The Astronomical Journal*. *Helmuth A. Abt.* **322**, 1073, 151-C11 (1987)
- ADAM, J. Ultraviolet Doubly Excited Fe II Lines in the Laboratory and in the A-Type Star 21 Pegasi. *J. Adam, B. Baschek, S. Johansson, A. E. Nilsson, and T. Brage.* **312**, 337, 4-E6 (1987)
- ADAMS, FRED C. Spectral Evolution of Young Stellar Objects. *Fred C. Adams, Charles J. Lada, and Frank H. Shu.* **312**, 788, 11-E3 (1987)
- ADAMS, JAMES H., JR. Very High Energy Gamma-Ray Spectroscopy. *David Eichler and James H. Adams, Jr.* **317**, 551, 70-A1 (1987)
- ADAMS, NIGEL G. Ion-Molecule Calculation of the Abundance Ratio of CCD to CCH in Dense Interstellar Clouds. *Eric Herbst, Nigel G. Adams, David Smith, and D. J. DeFrees.* **312**, 351, 4-F7 (1987)
- On the Synthesis of $c\text{-C}_2\text{H}_2$ in Interstellar Clouds. *Nigel G. Adams and David Smith.* **317**, L25, 71-B13 (1987)
- ADAMS, P. J. Inhomogeneous Cosmology. III. Primordial Gravitational Waves and Dust. *P. J. Adams, R. W. Hellings, and R. L. Zimmerman.* **318**, 1, 79-A5 (1987)
- AFAF, M. Singlet Systems of Zirconium Oxide. *M. Afaf.* **314**, 415, 32-F8 (1987)
- AGGARWAL, K. M. Emission-Line Ratios for O III in Gaseous Nebulae and a Comparison between Theory and Observation. *F. P. Kennan and K. M. Aggarwal.* **319**, 403, 97-E7 (1987)
- A'HEARN, MICHAEL F. The Bare Nucleus of Comet Neujmin 1. *Humberto Campins, Michael F. A'Hearn, and Lucy-Ann McFadden.* **316**, 847, 61-D1 (1987)
- AJELLO, J. M. Electron Impact Excitation of H_2 : Rydberg Band Systems and the Benchmark Dissociative Cross Section of H Lyman-Alpha. *D. E. Shemansky, J. M. Ajello, and D. T. Hall.* **315**, 408, 44-C14 (1987) (Orig. paper in **296**, 765, 98-D6)
- Solar Cycle Study of Interplanetary Lyman-Alpha Variations: PIONEER VENUS Orbiter Sky Background Results. *J. M. Ajello, A. I. Stewart, G. E. Thomas, and A. Graps.* **317**, 964, 76-F5 (1987)
- ALBINSON, J. S. IRAS Observations of Collisionally Heated Dust in Large Magellanic Cloud Supernova Remnants. *James R. Graham, A. Evans, J. S. Albinson, M. F. Bode, and W. P. S. Meikle.* **319**, 126, 94-D5 (1987)
- ALCAINO, GONZALO. BVI CCD Photometry of 47 Tucanae. *Gonzalo Alcaino and William Liller.* **319**, 304, 96-C9 (1987)
- ALCOCK, C. A. The Quark-Hadron Phase Transition and Primordial Nucleosynthesis. *C. A. Alcock, G. M. Fuller, and G. J. Mathews.* **320**, 439, 114-C1 (1987)
- ALLAMANDOLA, L. J. Anharmonicity and the Interstellar Polycyclic Aromatic Hydrocarbon Infrared Emission Spectrum. *John R. Barker, L. J. Allamandola, and A. G. G. M. Tielens.* **315**, L61, 45-E14 (1987)
- ALLEN, A. J. Dynamical Heating of Stars as a Fueling Mechanism for Active Galactic Nuclei. *A. J. Allen and P. A. Hughes.* **313**, 152, 16-F2 (1987)
- ALLER, H. D. see MAKINO, F., et al.
- ALLER, L. H. A Spectroscopic Survey of 51 Planetary Nebulae. *L. H. Aller and C. D. Keyes.* **65**, 405, 34-A1 (1987) (Abstr. in **321**, 1051, 136-A2)
- ALLER, LAWRENCE H. The (C III $\lambda 1909$ /Si III $\lambda 1892$) Ratio as a Diagnostic for Planetary Nebulae and Symbiotic Stars. *Walter A. Feibelman and Lawrence H. Aller.* **319**, 407, 97-E11 (1987)
- Physical Parameters for 12 Planetary Nebulae and Their Central Stars in the Magellanic Clouds. *Lawrence H. Aller, Charles D. Keyes, Stephen P. Maran, Theodore R. Gull, Andrew G. Michalitsianos, and Theodore P. Stecher.* **320**, 159, 109-F12 (1987)
- ALLER, M. F. see MAKINO, F., et al.
- ALTAMORE, A. A Detailed Study of the C IV $\lambda 1550$ Line Profile and Adjacent Spectral Features in NGC 4151 from 1978 to 1983. *J. Clavel, A. Altamore, A. Boksenberg, G. E. Bromage, A. Elvius, D. Pelat, M. V. Penston, G. C. Perola, M. A. J. Snijders, and M. H. Ulrich.* **321**, 251, 125-A5 (1987)
- ALTNER, BRUCE. The Progenitor of SN 1987A: Spatially Resolved Ultraviolet Spectroscopy of the Supernova Field. *George Sonneborn, Bruce Altner, and Robert P. Kirshner.* **323**, L35, 158-C7 (1987)
- ALTSCHULER, DANIEL R. Atomic Hydrogen in Planetary Nebulae. *Stephen E. Schneider, Peter R. Silverglete, Daniel R. Altschuler, and Carlo Giovanardi.* **314**, 572, 35-G1 (1987)
- AMANO, T. Laboratory Detection of HC_3NH^+ by Infrared Difference Frequency Laser Spectroscopy. *Sung K. Lee and T. Amano.* **323**, L145, 164-E4 (1987)
- AMANO, TAKAYOSHI. The Laboratory Observation of the $J = 1-0$, $K = 0$ Transition of the H_3S^+ Ion. *Shuji Saito, Satoshi Yamamoto, and Takayoshi Amano.* **314**, L27, 33-C14 (1987)
- AMBRUSTER, CAROL W. Rapid, Low-Level X-Ray Variability in Active Late-Type Dwarfs. *Carol W. Ambuster, Salvatore Sciortino, and L. Golub.* **65**, 273, 32-B4 (1987) (Abstr. in **319**, 1012, 106-A10)
- ANDERSON, E. Forbidden Line and H α Profiles in T Tauri Star Spectra: A Probe of Anisotropic Mass Outflows and Circumstellar Disks. *Suzan Edwards, Sylvie Cabrit, Stephen E. Strom, Ingeborg Heyer, Karen M. Strom, and E. Anderson.* **321**, 473, 127-C10 (1987)
- ANDERSON, JOHN D. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. *John D. Anderson, Timothy P. Krisher, Susan E. Borutski, Michael J. Connally, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen.* **323**, L141, 164-E1 (1987)
- ANDERSON, LAWRENCE. Statistical Mechanics of Partially Ionized Stellar Plasmas: The Planck–Larkin Partition Function, Polarization Shifts, and Simulations of Optical Spectra. *Werner Däppen, Lawrence Anderson, and Dimitri Mihalas.* **319**, 195, 95-B6 (1987)
- ANDERSON, SCOTT F. The X-Ray Properties of High-Redshift Quasi-stellar Objects. *Scott F. Anderson and Bruce Margon.* **314**, 111, 29-B14

- (1987)
- ANDERSON, TODD. The Laboratory Millimeter- and Submillimeter-Wave Spectrum of ^{13}C Methanol. *Todd Anderson, Eric Herbst, and Frank C. De Lucia*. **64**, 703, 27-E4 (1987) (Abstr. in **318**, 946, 91-C11)
- ANDREANI, P. The Large-Scale Anisotropies of the Extragalactic Infrared Background. *R. Fabbri, P. Andreani, F. Melchiorri, and B. Nisini*. **315**, 12, 40-B4 (1987)
- ANGERHOFER, P. E. Evidence for Refractive Scintillation of Two Extragalactic Sources Seen through the Galactic Disk. *Brian Dennison, R. Fiedler, K. J. Johnston, J. H. Spencer, E. B. Waltman, P. E. Angerhofer, D. R. Florkowski, F. J. Jostes, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. **313**, 141, 16-E5 (1987)
- Daily Observations of Compact Extragalactic Radio Sources at 2695 and 8085 MHz, 1979-1985. *R. L. Fiedler, E. B. Waltman, J. H. Spencer, K. J. Johnston, P. E. Angerhofer, D. R. Florkowski, F. J. Jostes, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. **65**, 319, 33-A5 (1987) (Abstr. in **321**, 1050, 136-A1)
- ANGLADA, G. Are the High-Velocity Molecular Flows Really Clumpy? *J. Cantó, L. F. Rodríguez, and G. Anglada*. **321**, 877, 134-B11 (1987)
- ANGUITA, C. IRAS 18059 - 3211: Optically Known As Gomez's Hamburger: Erratum. *M. T. Ruiz, V. Blanco, J. Maza, S. Heathcote, A. Phillips, K. Kawara, C. Anguita, M. Hamuy, and A. Gomez*. **320**, L157, 121-F14 (1987) (Orig. paper in **316**, L21, 56-B10)
- ANGUITA, CLAUDIO. IRAS 1809 - 3211: Optically Known as "Gomez's Hamburger". *Maria Teresa Ruiz, Victor Blanco, José Maza, Steve Heathcote, Andrew Phillips, Kimiaki Kawara, Claudio Anguita, Mario Hamuy, and Arturo Gomez*. **316**, L21, 56-B10 (1987)
- ANTIA, H. M. New Limits to Bias and the Amount of Dark Matter in the Universe. *William C. Saslaw, H. M. Antia, and S. M. Chitre*. **315**, L1, 45-A4 (1987)
- ANTIOCHOS, S. K. A Numerical Study of the Nonlinear Thermal Stability of Solar Loops. *J. A. Klimchuk, S. K. Antiochos, and J. T. Mariska*. **320**, 409, 112-D13 (1987)
- ANTIOCHOS, SPIRO K. The Topology of Force-Free Magnetic Fields and Its Implications for Coronal Activity. *Spiro K. Antiochos*. **312**, 886, 12-E10 (1987)
- ANTONUCCI, E. Simulations of the Ca XIX Spectral Emission from a Flaring Solar Coronal Loop. I. Thermal Case. *E. Antonucci, M. A. Doder, G. Peres, S. Serio, and R. Rosner*. **322**, 522, 143-F1 (1987)
- APPARAO, KRISHNA M. V. Effect of Balmer Continuum Absorption on Line Emission from Be Stars. *Krishna M. V. Apparao and S. P. Tarafdar*. **322**, 976, 150-E7 (1987)
- APPLEGATE, JAMES H. Magnetic Activity, Tides, and Orbital Period Changes in Close Binaries. *James H. Applegate and Joseph Patterson*. **322**, L99, 152-D4 (1987)
- APPLETON, P. N. Star Formation Rates in Ring Galaxies from IRAS Observations. *P. N. Appleton and Curtis Struck-Marcell*. **312**, 566, 9-A12 (1987)
- Models of Ring Galaxies. I. The Growth and Disruption of Clouds in the Expanding Density Wave. *P. N. Appleton and Curtis Struck-Marcell*. **318**, 103, 80-A14 (1987)
- Models of Ring Galaxies. II. Extended Starbursts. *Curtis Struck-Marcell and P. N. Appleton*. **323**, 480, 159-G5 (1987)
- ARCORAGI, J.-P. Neutron Capture Nucleosynthesis during Core Helium Burning in Massive Stars. *N. Prantzos, M. Arnould, and J.-P. Arcoragi*. **315**, 209, 42-C6 (1987)
- ARENDT, RICHARD. Multiple-Shell Planetary Nebulae. I. Morphologies and Frequency of Occurrence. *You-Hua Chu, George H. Jacoby, and Richard Arendt*. **64**, 529, 24-C1 (1987) (Abstr. in **317**, 1002, 77-B5)
- ARENDT, RICHARD G. Resolution of Compact Knots in Cassiopeia A. *Richard G. Arendt and John R. Dickel*. **315**, 567, 46-G8 (1987)
- ARENS, JOHN F. Direct Imaging at 12 Microns of the Star-forming Region W51 IRS 2. *John Bally, John F. Arens, Roger Ball, Robert Becker, and John Lacy*. **323**, L73, 158-F1 (1987)
- ARMSTRONG, J. W. A Search for Sinusoidal Gravitational Radiation in the Period Range 30-2000 Seconds. *J. W. Armstrong, F. B. Estabrook, and H. D. Wahlquist*. **318**, 536, 86-F8 (1987)
- ARNAL, E. M. Comet Halley: OH Absorption of Galactic Background Radio Sources. *E. Bajaja, E. M. Arnal, J. C. Cerosimo, F. R. Colomb, M. C. Martin, J. Mazzaro, R. Morras, J. C. Olalde, W. G. L. Pöppel, A. M. Silva, I. F. Mirabel, and V. Boriakoff*. **313**, 906, 26-F2 (1987)
- Observation of the OH 1667 MHz Line toward Comet Halley from the Southern Hemisphere. *E. Bajaja, R. Morras, W. G. L. Pöppel, J. E. Cerosimo, M. C. Martin, J. Mazzaro, J. C. Olalde, A. Silva, E. M. Arnal, F. R. Colomb, I. F. Mirabel, and V. Boriakoff*. **322**, 549, 144-A1 (1987)
- ARNETT, W. DAVID. Nucleosynthesis inside Thick Accretion Disks around a Black Hole. I. Thermodynamic Conditions and Preliminary Analysis. *Sandip K. Chakrabarti, Liping Jin, and W. David Arnett*. **313**, 674, 24-B10 (1987)
- Supernova Theory and Supernova 1987A. *W. David Arnett*. **319**, 136, 94-E1 (1987)
- ARNOULD, M. Neutron Capture Nucleosynthesis during Core Helium Burning in Massive Stars. *N. Prantzos, M. Arnould, and J.-P. Arcoragi*. **315**, 209, 42-C6 (1987)
- ARONS, JONATHAN. Radiation Gas Dynamics of Polar Cap Accretion onto Magnetized Neutron Stars: Basic Theory. *Jonathan Arons, Richard I. Klein, and Susan M. Lea*. **312**, 666, 10-C1 (1987)
- High-Luminosity Accretion in Wind-driven Binary X-Ray Sources. *Cheng Ho and Jonathan Arons*. **316**, 283, 53-B3 (1987)
- Fluctuation of Wind-driven Accretion in X-Ray Binaries. *Cheng Ho and Jonathan Arons*. **321**, 404, 126-E11 (1987)
- ARP, HALTON. The Galaxy-Quasar Connection: NGC 4319 and Markarian 205. I. Direct Imagery. *Jack W. Sulentic and Halton Arp*. **319**, 687, 102-D12 (1987)
- The Galaxy-Quasar Connection: NGC 4319 and Markarian 205. II. Spectroscopy. *Jack W. Sulentic and Halton Arp*. **319**, 693, 102-E10 (1987)
- ARQUILLA, R. A. CO Observations of IRAS Sources with 11.3 Micron Silicon Carbide Dust Features. *D. A. Leahy, Sun Kwok, and R. A. Arquilla*. **320**, 825, 118-F13 (1987)
- ASSIS, ALTAIR S. Cerenkov Damping of Surface Waves. *Altair S. Assis and J. Busnardo-Neto*. **323**, 399, 157-D10 (1987)
- ATHANASSOULA, E. Nonlinear Coupling of Galactic Spiral Modes. *M. Tagger, J. F. Sygnet, E. Athanassoula, and R. Pellat*. **318**, L43, 92-B4 (1987)
- ATHAY, R. GRANT. The Magnetic and Velocity Structure Adjacent to Solar Active Regions. *R. Grant Athay and J. A. Klimchuk*. **318**, 437, 83-F7 (1987)
- ATMANSPACHER, H. Deterministic Chaos in Accreting Systems: Analysis of the X-Ray Variability of Hercules X-1. *W. Voges, H. Atmanspacher, and H. Scheingraber*. **320**, 794, 118-D10 (1987)
- ATTEIA, J.-L. Gamma-Ray Burst Counterparts: Infrared. *Bradley E. Schaefer, T. L. Cline, U. Desai, B. J. Teegarden, J.-L. Atteia, C. Barat, K. Hurley, M. Niel, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, I. V. Estulin, and A. V. Kuznetsov*. **313**, 226, 17-D9 (1987)
- Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. *J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Koweliotou, T. Cline, B. Dennis, U. Desai, and L. Orwig*. **320**, L105, 121-C7 (1987)
- A New Type of Repetitive Behavior in a High-Energy Transient. *J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Koweliotou, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. **320**, L111, 121-C13 (1987)
- SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806 - 20. *C. Koweliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Neil, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. **322**, L21, 145-B8 (1987)
- ATWOOD, B. High-Redshift QSO Absorbing Clouds and the Background Ionizing Source. *R. F. Carswell, J. K. Webb, J. A. Baldwin, and B. Atwood*. **319**, 709, 102-F13 (1987)
- AUER, L. H. Atmospheric Eclipses in the SMC Wolf-Rayet Eclipsing Binary HD 5980: The Heavy versus the Light Metal Abundance. *G. Koenigsberger, A. F. J. Moffat, and L. H. Auer*. **322**, L41, 145-C12 (1987)
- AUGENSEN, HARRY J. Mass Distribution and Evolutionary Scheme for Central Stars of Planetary Nebulae. *Sara R. Heap and Harry J. Augensen*. **313**, 268, 17-G10 (1987)
- AUSTIN, SAM M. Radiative Alpha-Capture Rates Leading to $A = 7$ Nuclei: Applications to the Solar Neutrino Problem and Big Bang Nucleosynthesis. *Toshitaka Kajino, Hiroshi Toki, and Sam M. Austin*. **319**, 531, 99-A12 (1987)
- AVERY, L. W. Observations of Globules and Dark Clouds in the CO $J = 3-2$ and $J = 2-1$ Lines. *L. W. Avery, Glenn J. White, I. P. Williams, and N. Cronin*. **312**, 848, 12-B13 (1987)
- AVRETT, E. H. Mass Loss from FU Orionis Objects. *Ken Crosswell, L. Hartmann, and E. H. Avrett*. **312**, 227, 3-D6 (1987)
- BAAN, W. A. The Leo Triplet Spiral Galaxy NGC 3628. I. VLA Observations of the Neutral Hydrogen Absorption. *J. T. Schmelz, W. A. Baan, and A. D. Haschick*. **315**, 492, 46-B3 (1987)
- The Leo Triplet Spiral Galaxy NGC 3628. II. VLA Observations of the Hydroxyl Absorption. *J. T. Schmelz, W. A. Baan, and A. D. Haschick*. **320**, 145, 109-E11 (1987)
- The Megamaser Galaxy Markarian 273. I. VLA Observations of the

- Hydroxyl Emission. *J. T. Schmelz, W. A. Baan, and A. D. Haschick.* **321**, 225, 124-F6 (1987)
- BAAN, WILLEM A. The Peculiar Galaxy IC 4553. II. VLA Observations of the Neutral Hydrogen. *Willem A. Baan, J. H. van Gorkom, Joan T. Schmelz, and I. Felix Mirabel.* **313**, 102, 16-B7 (1987)
- The 18 Centimeter OH Emission of IC 4553 (Arp 220). *Willem A. Baan and Aubrey D. Haschick.* **318**, 139, 80-D10 (1987)
- Zw 15107 + 0724 and the Family of OH Megamasers. *Willem A. Baan, Christian Henkel, and Aubrey D. Haschick.* **320**, 154, 109-F6 (1987)
- BABUL, ARIF. Gamma-Ray Bursts from Superconducting Cosmic Strings at Large Redshifts. *Arif Babul, Bohdan Paczyński, and David Spergel.* **316**, L49, 62-A9 (1987)
- Model Atmospheres of Near-Eddington Limit X-Ray Bursters. *Arif Babul and Bohdan Paczyński.* **323**, 582, 161-B5 (1987)
- BACKER, D. C. VLBI Structure of 3C 84 at 89 GHz. *D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman.* **322**, 74, 138-F11 (1987)
- BAGARE, S. P. Chromospheric Ca II K-Line Variations in the Sun as a Star over a Solar Cycle. *K. R. Sivaraman, Jagdev Singh, S. P. Bagare, and S. S. Gupta.* **313**, 456, 20-A6 (1987)
- BAGGETT, W. E. The Activity, Variability, and Rotation of Lower Main-Sequence Hyades Stars. *Richard R. Radick, D. T. Thompson, G. W. Lockwood, D. K. Duncan, and W. E. Baggett.* **321**, 459, 127-B10 (1987)
- BAHCALL, J. N. Is Solar Neutrino Capture Rate Correlated with Sunspot Number? *J. N. Bahcall, G. B. Field, and W. H. Press.* **320**, L69, 114-F1 (1987)
- BAHCALL, JOHN N. Dust Distribution in Spiral Galaxies. *Nikolaos D. Kylafis and John N. Bahcall.* **317**, 637, 73-A13 (1987)
- An Analysis of the Yale Bright Star Catalog. *John N. Bahcall, Stefano Casertano, and Kavan U. Ratnatunga.* **320**, 515, 115-B10 (1987)
- BAI, T. Periodicities of the Flare Occurrence Rate in Solar Cycle 19. *T. Bai.* **318**, L85, 92-E6 (1987)
- BAI, TAEIL. Distribution of Flares on the Sun: Superactive Regions and Active Zones of 1980-1985. *Taeil Bai.* **314**, 795, 38-C9 (1987)
- BAIERLEIN, R. Shock-Front Compression of the Magnetic Field in the Canis Major R1 Star Formation Region. *F. J. Vrba, R. Baierlein, and W. Herbst.* **317**, 207, 66-C4 (1987)
- BAILYN, CHARLES D. Compact X-Ray Binaries in Hierarchical Triples. I. Tidal Angular Momentum Loss and GX 17 + 2. *Charles D. Bailyn and Jonathan E. Grindlay.* **312**, 748, 11-B4 (1987)
- On the Evolution of Tidal Capture X-Ray Binaries: 4U 2127 + 12 (M15) to 4U 1820 - 30 (NGC 6624). *Charles D. Bailyn and Jonathan E. Grindlay.* **316**, L25, 56-C3 (1987)
- Compact X-Ray Binaries in Hierarchical Triples. II. Separation of the Inner Binary. *Charles D. Bailyn.* **317**, 737, 74-B3 (1987)
- CCD Photometry of Globular Cluster Core Structure. I. NGC 6388, NGC 6624, and M15—One Flat Core and Two Cusps. *Phyllis M. Lugger, Haldan Cohn, Jonathan E. Grindlay, Charles D. Bailyn, and Paul Hertz.* **320**, 482, 114-F8 (1987)
- BAJAJA, E. Comet Halley: OH Absorption of Galactic Background Radio Sources. *E. Bajaja, E. M. Arnal, J. C. Cerosimo, F. R. Colomb, M. C. Martin, J. Mazzaro, R. Morras, J. C. Olalde, W. G. L. Poppel, A. M. Silva, I. F. Mirabel, and V. Boriakoff.* **313**, 906, 26-F2 (1987)
- Observation of the OH 1667 MHz Line toward Comet Halley from the Southern Hemisphere. *E. Bajaja, R. Morras, W. G. L. Poppel, J. E. Cerosimo, M. C. Martin, J. Mazzaro, J. C. Olalde, A. Silva, E. M. Arnal, F. R. Colomb, I. F. Mirabel, and V. Boriakoff.* **322**, 549, 144-A1 (1987)
- BALDWIN, J. A. Kinematics and Ionization of Extended Gas in Active Galaxies. III. The Extranuclear Properties of NGC 1068. *J. A. Baldwin, A. S. Wilson, and Mark Whittle.* **319**, 84, 94-A3 (1987)
- High-Redshift QSO Absorbing Clouds and the Background Ionizing Source. *R. F. Carswell, J. K. Webb, J. A. Baldwin, and B. Atwood.* **319**, 709, 102-F13 (1987)
- BALFOUR, WALTER J. The Near-Infrared Spectrum of the FeH Molecule. *John G. Phillips, Sumner P. Davis, Bo Lindgren, and Walter J. Balfour.* **65**, 721, 39-F2 (1987) (Abstr. in **322**, 1077, 151-G3)
- BALIUNAS, S. L. Periodic Photospheric and Chromospheric Modulation in Alpha Orionis (Betelgeuse). *A. K. Dupree, S. L. Baliunas, E. F. Guinan, L. Hartmann, G. E. Nassisopoulos, and G. Sonneborn.* **317**, L86, 78-D4 (1987)
- BALIUNAS, SALLIE L. Objective Characterization of Stellar Activity Cycles. I. Methods and Solar Cycle Analyses. *Ronald L. Gilliland and Sallie L. Baliunas.* **314**, 766, 38-A6 (1987)
- BALL, R. Molecular Spiral Structure in M51. *K. Y. Lo, R. Ball, C. R. Masson, T. G. Phillips, S. Scott, and D. P. Woody.* **317**, L63, 78-B11 (1987)
- Giant Molecular Clouds in M31. *S. N. Vogel, F. Boulanger, and R. Ball.* **321**, L145, 137-D8 (1987)
- BALL, ROGER. Direct Imaging at 12 Microns of the Star-forming Region W51 IRS 2. *John Bally, John F. Arens, Roger Ball, Robert Becker, and John Lacy.* **323**, L73, 158-F1 (1987)
- BALLESTER, G. E. Detection of Neutral Oxygen and Sulfur Emissions near Io Using IUE. *G. E. Ballester, H. W. Moos, P. D. Feldman, D. F. Strobel, M. E. Summers, J.-L. Bertaux, T. E. Skinner, M. C. Festou, and J. H. Lieske.* **319**, L33, 100-D1 (1987)
- BALLY, JOHN. Filamentary Structure in the Orion Molecular Cloud. *John Bally, William D. Langer, Antony A. Stars, and Robert W. Wilson.* **312**, L45, 14-B12 (1987)
- Infrared Emission and Star Formation in Early-Type Galaxies. *Harley A. Thronson, Jr. and John Bally.* **319**, L63, 107-D1 (1987)
- Detection of Interstellar PN: The First Identified Phosphorus Compound in the Interstellar Medium. *B. E. Turner and John Bally.* **321**, L75, 129-G11 (1987)
- Properties of Evolved Mass-losing Stars in the Milky Way and Variations in the Interstellar Dust Composition. *Harley A. Thronson, Jr., William B. Latter, John H. Black, John Bally, and Perry Hacking.* **322**, 770, 148-C5 (1987)
- Direct Imaging at 12 Microns of the Star-forming Region W51 IRS 2. *John Bally, John F. Arens, Roger Ball, Robert Becker, and John Lacy.* **323**, L73, 158-F1 (1987)
- Galactic Center Molecular Clouds. I. Spatial and Spatial-Velocity Maps. *John Bally, Antony A. Stark, Robert W. Wilson, and Christian Henkel.* **65**, 13, 28-B2 (1987) (Abstr. in **319**, 1011, 106-A9)
- BALONEK, THOMAS J. Optical and Near-Infrared Observations of BL Lacertae Objects and Active Quasars. *Paul S. Smith, Thomas J. Balonek, Richard Elston, and Paul A. Heckert.* **64**, 459, 22-G9 (1987) (Abstr. in **316**, 860, 61-E2)
- BALTRUSAITIS, R. M. Sporadic and Periodic 10-1000 TeV Gamma Rays from Cygnus X-3. *R. M. Baltrusaitis, G. L. Cassiday, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebing, C. P. Lingle, E. C. Loh, P. Sokolsky, P. Sommers, and D. Steck.* **323**, 685, 162-C1 (1987)
- BAND, DAVID L. On Nonthermal Models for Active Galactic Nuclei. *David L. Band.* **321**, 80, 123-A9 (1987)
- BANDIERA, RINO. On the Origin of Kepler's Supernova Remnant. *Rino Bandiera.* **319**, 885, 104-F1 (1987)
- BANIA, T. M. Measurements of the ^4He Abundance in the Interstellar Medium. *T. M. Bania, Robert T. Rood, and T. L. Wilson.* **323**, 30, 153-D3 (1987)
- BARAT, C. Gamma-Ray Burster Counterparts: Infrared. *Bradley E. Schaefer, T. L. Cline, U. Desai, B. J. Teegarden, J.-L. Atteia, C. Barat, K. Hurley, M. Niel, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, I. V. Estulin, and A. V. Kuznetsov.* **313**, 226, 17-D9 (1987)
- Short Solar Events with Evidence of Repetitive Structures. *Upendra D. Desai, Chryssa Kowalewicz, C. Barat, K. Hurley, M. Niel, R. Talon, G. Vedrenne, I. V. Estulin, and V. Ch. Dolidze.* **319**, 567, 99-E1 (1987)
- BARBER, MICHAEL. The Perseus Flasher and Satellite Glints. *Bradley E. Schaefer, Michael Barber, John J. Brooks, Allen DeForrest, Paul D. Maley, Norman W. McLeod III, Russ McNiel, Andrew J. Noymer, A. K. Presnell, Richard Schwartz, and Scott Whitney.* **320**, 398, 112-D2 (1987)
- BARBERO, J. Ultraviolet Observations by the IUE of 31 Clusters of the Large Magellanic Cloud. *A. Cassatella, J. Barbero, and E. H. Geyer.* **64**, 83, 18-A7 (1987) (Abstr. in **314**, 832, 38-F8)
- BARBOSA, D. D. Beaming of Uranian Kilometric Radiation and Implications for the Planetary Magnetic Field. *D. D. Barbosa.* **315**, L151, 49-G6 (1987)
- Planetary Fast Neutral Emission and Effects on the Solar Wind: A Cometary Exosphere Analog: Erratum. *D. D. Barbosa and A. Eviar.* **321**, 1049, 136-A1 (1987) (Orig. paper in **310**, 927, 144-B10)
- BARCONS, XAVIER. X-Ray Radiation from the Intergalactic Plasma. *Xavier Barcons.* **313**, 547, 22-F11 (1987)
- BARDEEN, J. M. Cosmic Fluctuation Spectra with Large-Scale Power. *J. M. Bardeen, J. R. Bond, and G. Efstathiou.* **321**, 28, 122-D1 (1987)
- BARDEN, SAMUEL C. Detection of a BY Draconis-like Binary Companion to the Contact Binary XY Leonis. *Samuel C. Barden.* **317**, 333, 67-E4 (1987)
- BARKER, E. S. Supernovae 1983i and 1983v: Evidence for Abundance Variations in Type Ib Supernovae. *J. C. Wheeler, R. P. Harkness, E. S. Barker, A. L. Cochran, and D. Wills.* **313**, L69, 27-C11 (1987)
- The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. *R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Leavelle.* **317**, 355, 67-F14 (1987)
- BARKER, JOHN R. Anharmonicity and the Interstellar Polycyclic Aromatic Hydrocarbon Infrared Emission Spectrum. *John R. Barker, L. J. Allamandola, and A. G. G. M. Tielens.* **315**, L61, 45-E14 (1987)
- BARKER, TIMOTHY. The Ionization Structure of Planetary Nebulae. VII.

- New Observations of the Ring Nebula. *Timothy Barker*. **322**, 922, 150-A6 (1987)
- BARLOW, M. J. The Planetary Nebula NGC 3918. *R. E. S. Clegg, J. P. Harrington, M. J. Barlow, and J. R. Walsh*. **314**, 551, 35-E7 (1987)
- BARNES, ALAN V. The Initial Neutrino Events from Supernovae as Evidence for Matter versus Antimatter. *Alan V. Barnes, Thomas J. Weiler, and Sandip Pakusa*. **323**, L31, 158-C4 (1987)
- BARNES, JOSHUA. Angular Momentum from Tidal Torques. *Joshua Barnes and George Efstathiou*. **319**, 575, 101-C1 (1987)
- BARNES, THOMAS G., III. Observational Studies of Cepheids. VI. Period-Radius Relations. *Thomas J. Moffett and Thomas G. Barnes III*. **323**, 280, 156-B5 (1987)
- Observational Studies of Cepheids. V. Radial Velocities of Bright Cepheids. *Thomas G. Barnes III, Thomas J. Moffett, and Mark H. Slovak*. **65**, 307, 32-E1 (1987) (Abstr. in **320**, 937, 120-B2)
- BAR-NUN, AKIVA. On the Evolution and Activity of Cometary Nuclei. *Dina Prialnik and Akiva Bar-Nun*. **313**, 893, 26-E3 (1987)
- Radiogenic Heating of Comets by ^{26}Al and Implications for Their Time of Formation. *Dina Prialnik, Akiva Bar-Nun, and Morris Podolak*. **319**, 993, 105-G1 (1987)
- BARON, E. Collapse of $9 M_{\odot}$ Stars. *E. Baron, J. Cooperstein, and S. Kahana*. **320**, 300, 111-D1 (1987)
- Collapsing White Dwarfs. *E. Baron, J. Cooperstein, S. Kahana, and K. Nomoto*. **320**, 304, 111-D5 (1987)
- Neutrino Pair Energy Deposition in Supernovae. *J. Cooperstein, L. J. van den Horn, and E. Baron*. **321**, L129, 137-C7 (1987)
- The Appearance of Primeval Galaxies. *E. Baron and Simon D. M. White*. **322**, 585, 146-C1 (1987)
- BARON, E. A. Neutrino Flows in Collapsing Stars: A Two-Fluid Model: Erratum. *J. Cooperstein, L. J. van den Horn, and E. A. Baron*. **315**, 729, 48-E10 (1987) (Orig. paper in **309**, 653, 128-D5)
- BARR, P. X-Ray and Optical Observations of X-Ray-Selected BL Lacertae Objects. *P. Giommi, P. Barr, B. Garilli, I. M. Gioia, T. Maccararo, D. Maccagni, and R. E. Schild*. **322**, 662, 146-A10 (1987)
- BARRETT, J. Mass, Luminosity, and Line Width Relations of Galactic Molecular Clouds. *P. M. Solomon, A. R. Rivolo, J. Barrett, and A. Yahil*. **319**, 730, 103-A8 (1987)
- BARRY, DON C. Chromospheric Activity and Ages of Solar-Type Stars. *Don C. Barry, Richard H. Cromwell, and E. Keith Hege*. **315**, 264, 42-G5 (1987)
- BARTEL, N. VLBI Observations of 23 Hot Spots in the Starburst Galaxy M82. *N. Bartel, M. I. Ratner, A. E. E. Rogers, I. I. Shapiro, R. J. Bonometti, N. L. Cohen, M. V. Gorenstein, J. M. Marcaide, and R. A. Preston*. **323**, 505, 160-B3 (1987)
- BARTEL, NORBERT. 18 Centimeter VLBI Observations of the Quasar NRAO 140 during and after a Low-Frequency Outburst. *Alan P. Marscher, John J. Broderick, Lucia Padrielli, Norbert Bartel, and Jonathan D. Romney*. **319**, 456, 98-B8 (1987)
- BARVAINIS, RICHARD. Hot Dust and the Near-Infrared Bump in the Continuum Spectra of Quasars and Active Galactic Nuclei. *Richard Barvainis*. **320**, 537, 115-D4 (1987)
- BASART, J. P. Temperature and Emission-Measure Distributions for Several Planetary Nebulae. *J. P. Basart and C. T. Daub*. **317**, 412, 68-D14 (1987)
- BASCHEK, B. Ultraviolet Doubly Excited Fe II Lines in the Laboratory and in the A-Type Star 21 Pegasi. *J. Adam, B. Baschek, S. Johansson, A. E. Nilsson, and T. Brage*. **312**, 337, 4-E6 (1987)
- BASH, F. N. The Correlation of Spiral Arm Molecular Clouds with Cold Atomic Hydrogen. *W. L. Peters and F. N. Bash*. **317**, 646, 73-B8 (1987)
- BASH, FRANK N. Giant H II Regions in M81. *Michele Kaufman, Frank N. Bash, R. C. Kennicutt, Jr., and P. W. Hodge*. **319**, 61, 93-F7 (1987)
- BASRI, GIBOR. Stellar Activity in Synchronized Binaries. II. A Correlation Analysis with Single Stars. *Gibor Basri*. **316**, 377, 54-B9 (1987)
- The Atmospheres of T Tauri Stars. I. High-Resolution Calibrated Observations of Moderately Active Stars. *Ulrich Finkenzeller and Gibor Basri*. **318**, 823, 90-A2 (1987)
- BASTIAN, T. S. The Discovery of Nonthermal Radio Emission from Magnetic Bp-Ap Stars. *Stephen A. Drake, David C. Abbott, T. S. Bastian, J. H. Bieging, E. Churchwell, G. Dulk, and Jeffrey L. Linsky*. **322**, 902, 149-F10 (1987)
- BASTIEN, PIERRE. Polarization, Jets, and the Distribution of Circumstellar Dust around T Tauri Stars and Other Young Infrared Sources. *Pierre Bastien*. **317**, 231, 66-D12 (1987)
- Polarization Variability among Wolf-Rayet Stars. I. Linear Polarization of a Complete Sample of Southern Galactic WC Stars. *Nicole St-Louis, Laurent Drissen, Anthony F. J. Moffat, Pierre Bastien, and Santiago Tapia*. **322**, 870, 149-C13 (1987)
- Polarization Variability among Wolf-Rayet Stars. II. Linear Polarization as a Complete Sample of Southern Galactic WN Stars. *Laurent Drissen, Nicole St-Louis, Anthony F. J. Moffat, and Pierre Bastien*. **322**, 888, 149-E5 (1987)
- BATES, DAVID R. Rate of $\text{CH}_3^+ + \text{H}_2 \rightarrow \text{CH}_5^+ + h\nu$ and Role of Electronic Transitions in Other Radiative Association Processes. *David R. Bates*. **312**, 363, 4-G5 (1987)
- Ion-Dipolar Molecule Rate Coefficients. *Wm. Lowell Morgan and David R. Bates*. **314**, 817, 38-E3 (1987)
- Ion-Dipolar Molecule Rate Coefficients: Erratum. *Wm. Lowell Morgan and David R. Bates*. **321**, 1049, 136-A1 (1987) (Orig. paper in **314**, 817, 38-E3)
- BATUSKI, DAVID J. Comparisons of the Spatial Distribution of Abell Clusters against Models with Gaussian Initial Conditions. *David J. Batuski, Adrian L. Melott, and Jack O. Burns*. **322**, 48, 138-D12 (1987)
- BAUM, WILLIAM A. Magnesium Gradients in Elliptical Galaxies. II. NGC 4881. *Bjarne Thomsen and William A. Baum*. **315**, 460, 45-F10 (1987)
- BEALL, J. H. Radiation from Relativistic Beams Interacting with Interstellar Gas. *W. K. Rose, J. H. Beall, J. Guillery, and S. Kainer*. **314**, 95, 29-A12 (1987)
- The Observational Appearance of Protostellar Accretion Disks. *J. H. Beall*. **316**, 227, 52-D10 (1987)
- BECHTOLD, JILL. High-Resolution Spectroscopy of the $z = 1.79$ Absorption-Line System toward B2 1225 + 317. *Jill Bechtold, Richard F. Green, and D. G. York*. **312**, 50, 1-E5 (1987)
- X-Ray Spectra of PG Quasars. II. The X-Ray-Ultraviolet Excess of PG 1211 + 143. *Jill Bechtold, Bozena Czerny, Martin Elvis, G. Fabbiano, and Richard F. Green*. **314**, 699, 37-C5 (1987)
- The Integrated Ultraviolet Radiation Field from QSOs. *Jill Bechtold, Ray J. Weymann, Zuo Lin, and Matthew A. Malkan*. **315**, 180, 42-A4 (1987)
- BECK, SARA C. Recombination Spectroscopy of Star-Formation Regions in the Nucleus of M83. *Jean L. Turner, Paul T. P. Ho, and Sara C. Beck*. **313**, 644, 23-G2 (1987)
- BECKER, R. H. G0.9 + 0.1 and the Emerging Class of Composite Supernova Remnants. *D. J. Helfand and R. H. Becker*. **314**, 203, 30-C10 (1987)
- VLA Observations of the Fast Pulsar Candidate in M28. *W. C. Erickson, M. J. Mahoney, R. H. Becker, and D. J. Helfand*. **314**, L45, 39-B9 (1987)
- High-Resolution Radio Observations of the Supernova Remnant G24.7 + 0.6 and the Discovery of an Ultracompact H II Region. *R. H. Becker and D. J. Helfand*. **316**, 660, 59-C10 (1987)
- BECKER, ROBERT. Direct Imaging at 12 Microns of the Star-forming Region W51 IRS 2. *John Bally, John F. Arens, Roger Ball, Robert Becker, and John Lacy*. **323**, L73, 158-F1 (1987)
- BECKER, ROBERT H. Discovery of Fast-moving Nitrogen-rich Ejecta in the Supernova Remnant Cassiopeia A. *Robert A. Fesen, Robert H. Becker, and William P. Blair*. **313**, 378, 19-B3 (1987)
- BECKLIN, E. E. Infrared Characteristics of the Nuclei of Normal Galaxies. *Nicholas A. Devereux, E. E. Becklin, and Nick Scoville*. **312**, 529, 8-F3 (1987)
- IRAS 23060 + 0505: A Highly Obscured $3.3 \times 10^{12} L_{\odot}$ Active Galaxy. *G. J. Hill, C. G. Wynn-Williams, and E. E. Becklin*. **316**, L11, 56-A14 (1987)
- Discovery of Broad Brackett- α Emission in Arp 220. *D. L. DePoy, E. E. Becklin, and T. R. Geballe*. **316**, L63, 62-B8 (1987)
- A Search for Brown Dwarfs and Late M Dwarfs in the Hyades and the Pleiades. *B. Zuckerman and E. E. Becklin*. **319**, L99, 107-F9 (1987)
- BECKWITH, S. Observations of Infrared Emission Lines and Radio Continuum Emission from Pre-Main-Sequence Objects. *Neal J. Evans II, Russell M. Lebreault, S. Beckwith, and Mike Skrutskie*. **320**, 364, 112-A9 (1987)
- BECKWITH, STEVEN. Kinematics of the Circumstellar Gas of HL Tauri and R Monocerotis. *Anneila I. Sargent and Steven Beckwith*. **323**, 294, 156-C5 (1987)
- BEECH, MARTIN. On the Lack of Evidence for Nonradial Pulsation in Wolf-Rayet Stars. *Jaymie M. Matthews and Martin Beech*. **313**, L25, 21-B12 (1987)
- BEECK, J. A. Multispacecraft Study of the Injection and Transport of Solar Energetic Particles. *J. Beeck, G. M. Mason, D. C. Hamilton, G. Wibberenz, H. Kunow, D. Hovestadt, and B. Klecker*. **322**, 1052, 151-D14 (1987)
- BEGELMAN, MITCHELL C. Thermal and Dynamical Effects of Pair Production on Two-Temperature Accretion Flows. *Mitchell C. Begelman, Marek Sikora, and Martin J. Rees*. **313**, 689, 24-C12 (1987)
- Broad, Variable Absorption Lines in the Seyfert Galaxy NGC 3516: Probing the Structure of the Emission-Line Regions. *G. Mark Voit, J. Michael Shull, and Mitchell C. Begelman*. **316**, 573, 58-C5 (1987)
- Electron Injection by Relativistic Protons in Active Galactic Nuclei. *Marek Sikora, John G. Kirk, Mitchell C. Begelman, and Peter Schneider*. **320**, L81, 121-B1 (1987)
- Inverse Compton Scattering of Ambient Radiation by a Cold Relativistic

- tic Jet: A Source of Beamed, Polarized Continuum in Blazars? *Mitchell C. Begelman and Marek Sikora*. **322**, 650, 146-G12 (1987)
- BEICHMAN, C. A. Near-Infrared and Optical Observations of IRAS Sources in and near Dense Cores. *P. C. Myers, Gary A. Fuller, R. D. Mathieu, C. A. Beichman, P. J. Benson, R. E. Schild, and J. P. Emerson*. **319**, 340, 96-F5 (1987)
- BENKSTEIN, JACOB D. Helicity Conservation Laws for Fluids and Plasmas. *Jacob D. Benkstein*. **319**, 207, 95-C4 (1987)
- BELL, R. A. Theoretical Isochrones for Globular Clusters with Predicted Thuan-Gunn Photometry. *R. A. Bell and Don A. Vandenberg*. **63**, 335, 5-D10 (1987) (Abstr. in **312**, 966, 13-E7)
- BENDINELLI, O. Deconvolution of Elliptical Nuclei of Galaxies: Application to M81: Erratum. *O. Bendinelli, G. Parmeggiani, and T. Zavatti*. **315**, 408, 44-C14 (1987) (Orig. paper in **308**, 611, 115-E14)
- BENGSTON, R. D. A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. *M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengston, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan*. **313**, 920, 26-G3 (1987)
- BENNETT, C. L. The Triple Radio Source 0023 + 171: A Candidate for a Dark Gravitational Lens. *J. N. Hewitt, E. L. Turner, C. R. Lawrence, D. P. Schneider, J. E. Gunn, C. L. Bennett, B. F. Burke, J. H. Mahoney, G. I. Langston, M. Schmidt, J. B. Oke, and J. G. Hoessel*. **321**, 706, 132-C5 (1987)
- BENNETT, CHARLES L. Spheromak Model of Planetary Nebulae. *Charles L. Bennett*. **323**, L123, 164-C7 (1987)
- BENNETT, J. Continuum Energy Distributions of Quasars in the Palomar-Green Survey. *G. Neugebauer, R. F. Green, K. Matthews, M. Schmidt, B. T. Soifer, and J. Bennett*. **63**, 615, 10-A7 (1987) (Abstr. in **313**, 929, 26-G12)
- BENSADOUN, MARC. Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. *George F. Smoot, Marc Bensadoun, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Witebsky*. **317**, L45, 78-A9 (1987)
- BENSON, J. M. The Radio Morphology of 3C 120 on Scales from 0.5 Parsecs to 400 Kiloparsecs. *R. C. Walker, J. M. Benson, and S. C. Unwin*. **316**, 546, 58-A5 (1987)
- BENSON, P. J. Near-Infrared and Optical Observations of IRAS Sources in and near Dense Cores. *P. C. Myers, Gary A. Fuller, R. D. Mathieu, C. A. Beichman, P. J. Benson, R. E. Schild, and J. P. Emerson*. **319**, 340, 96-F5 (1987)
- BENSON, PRISCILLA J. A Water Maser Associated with EU Andromedae: A Carbon Star Near an Oxygen-rich Circumstellar Shell. *Priscilla J. Benson and Irene R. Little-Marein*. **316**, L37, 56-C13 (1987)
- BENZ, W. Three-dimensional Hydrodynamical Simulations of Stellar Collisions. I. Equal-Mass Main-Sequence Stars. *W. Benz and J. G. Hills*. **323**, 614, 161-D9 (1987)
- BERGER, MITCHELL A. The Ejection of Helical Field Structures through the Outer Corona. *Lewis L. House and Mitchell A. Berger*. **323**, 406, 157-E4 (1987)
- BERNATH, P. F. Upper Limits to Interstellar PO. *H. E. Matthews, P. A. Feldman, and P. F. Bernath*. **312**, 358, 4-F14 (1987)
- BERRIMAN, GRAHAM. The Discovery of Near-Infrared Polarized Cyclotron Emission in the Intermediate Polar BG Canis Minoris. *Steven C. West, Graham Berriman, and Gary D. Schmidt*. **322**, L35, 145-C7 (1987)
- BERSANELLI, MARCO. Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. *George F. Smoot, Marc Bensadoun, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Witebsky*. **317**, L45, 78-A9 (1987)
- BERTAUX, J.-L. Detection of Neutral Oxygen and Sulfur Emissions near Io Using IUE. *G. E. Ballester, H. W. Moos, P. D. Feldman, D. F. Strobel, M. E. Summers, J.-L. Bertaux, T. E. Skinner, M. C. Festou, and J. H. Lieske*. **319**, L33, 100-D1 (1987)
- BERTOLA, F. NGC 5266: An Elliptical Galaxy with a Dust Ring. *S. R. Varnas, F. Bertola, G. Galletta, K. C. Freeman, and D. Carter*. **313**, 69, 15-F12 (1987)
- BERTSCHINGER, EDMUND. Cosmological Accretion Wakes. *Edmund Bertschinger*. **316**, 489, 57-D1 (1987)
- Path Integral Methods for Primordial Density Perturbations: Sampling of Constrained Gaussian Random Fields. *Edmund Bertschinger*. **323**, L103, 164-A14 (1987)
- BETHE, H. A. Convection in Supernova Theory. *H. A. Bethe, G. E. Brown, and J. Cooperstein*. **322**, 201, 140-B3 (1987)
- BETZ, A. L. New Lines of Ethylene and a Search for Methylene in IRC +10216. *D. M. Goldhaber, A. L. Betz, and J. J. Ottusch*. **314**, 356, 32-A13 (1987)
- BEUERMANN, K. Einstein Observations of EF Eridani (2A 0311 - 227), the Textbook Example of AM Herculis-type Systems. *K. Beuermann, L. Stella, and J. Patterson*. **316**, 360, 54-A6 (1987)
- BEUERMANN, KLAUS. The Optical Light Curve of the Low-Mass X-Ray Binary XB 1254 - 690. *Christian Match, Holger Pedersen, Klaus Beuermann, Manfred W. Pakull, and Thierry J.-L. Courvoisier*. **313**, 792, 25-D8 (1987)
- A New Soft X-Ray Mode in the AM Herculis Object E2003 + 225. *Julian P. Osborne, Klaus Beuermann, Philip Charles, Lawra Maraschi, Koji Mukai, and Aldo Treves*. **315**, L123, 49-E5 (1987)
- BHATIA, A. K. A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. *M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengston, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan*. **313**, 920, 26-G3 (1987)
- Laboratory Study of the Spectrum of Highly Ionized Calcium in the 100-250 Å Range Applied to Solar Flare Diagnostics. *S. Lippmann, M. Finkenthal, L. K. Huang, H. W. Moos, B. C. Stratton, T. L. Yu, A. K. Bhatia, and W. L. Hodge*. **316**, 819, 61-A11 (1987)
- BIANCHI, L. Are There Stellar Winds in the Hot Stars of M31? *J. B. Hutchings, Philip Massey, and L. Bianchi*. **322**, L79, 152-B13 (1987)
- BICAY, MICHAEL D. Far-Infrared Properties of Cluster Galaxies. *Michael D. Bicay and Riccardo Giovanelli*. **321**, 645, 131-E11 (1987)
- BIEBER, J. W. Magnetic Helicity of the Parker Field. *J. W. Bieber, P. A. Evenson, and W. H. Matthaeus*. **315**, 700, 48-C7 (1987)
- BIEGING, J. H. The Discovery of Nonthermal Radio Emission from Magnetic Bp-Ap Stars. *Stephen A. Drake, David C. Abbott, T. S. Bastian, J. H. Bieging, E. Churchwell, G. Dulk, and Jeffrey L. Linsky*. **322**, 902, 149-F10 (1987)
- BIEGING, JOHN H. The Circumstellar Envelope of W3(OH): NH₃ Observations. *Mark J. Reid, Philip C. Myers, and John H. Bieging*. **312**, 830, 12-A9 (1987)
- BIERMANN, P. 1928 + 738: A Superluminal Source with Large-Scale Structure. *K. J. Johnston, R. S. Simon, A. Eckart, P. Biermann, C. Schalinski, A. Witzel, and R. G. Strom*. **313**, L85, 27-D11 (1987)
- BIERMANN, P. L. Synchrotron Emission from Shock Waves in Active Galactic Nuclei. *P. L. Biermann and P. A. Strittmatter*. **322**, 643, 146-G5 (1987)
- BIGNAMI, G. F. EXOSAT and Einstein Observations of the X-Ray Pulsar 4U 1145 - 619. *S. Mereghetti, G. F. Bignami, P. A. Caraveo, and A. Goldwurm*. **312**, 755, 11-B11 (1987)
- A Deep Optical Study of the Field of 1E 0630 + 178. *G. F. Bignami, P. A. Caraveo, J. A. Paul, L. Salotti, and L. Vigroux*. **319**, 358, 97-A1 (1987)
- Diffuse Einstein X-Ray Emission from the Region of RCW 49, a Bright Southern Emission Nebula. *A. Goldwurm, P. A. Caraveo, and G. F. Bignami*. **322**, 349, 141-E12 (1987)
- BIONTA, R. M. see SVOBODA, R. et al.
- BIRD, M. C. The Broad-Line Region at the Center of the Galaxy. *T. R. Geballe, R. Wade, K. Krisciunas, I. Gatley, and M. C. Bird*. **320**, 562, 115-F12 (1987)
- Ionization State in and Reddening to the Center of the Galaxy. *R. Wade, T. R. Geballe, K. Krisciunas, I. Gatley, and M. C. Bird*. **320**, 570, 115-G7 (1987)
- BIRETTA, J. A. Evolution of 3C 273 at 10.7 GHz. *M. H. Cohen, J. A. Zensus, J. A. Biretta, G. Comoretto, P. Kaufmann, and Z. Abraham*. **315**, L89, 49-B11 (1987)
- BISHOP, JEFFREY L. Axisymmetric Shell Models with Stäckel Potentials. *Jeffrey L. Bishop*. **322**, 618, 146-E7 (1987)
- BJORKMAN, K. S. Highly Ionized Stellar Winds in Be Stars: The Evidence for Aspect Dependence. *C. A. Grady, K. S. Bjorkman, and T. P. Snow*. **320**, 376, 112-B8 (1987)
- BLACK, JOHN H. Molecules at Early Epochs. II. H₂ and CO toward PHL 957. *John H. Black, Frederic H. Chaffee, Jr., and Craig B. Foltz*. **317**, 442, 68-G2 (1987)
- Fluorescent Excitation of Interstellar H₂. *John H. Black and Ewine F. van Dishoeck*. **322**, 412, 142-C11 (1987)
- Properties of Evolved Mass-losing Stars in the Milky Way and Variations in the Interstellar Dust Composition. *Harley A. Thronson, Jr., William B. Latter, John H. Black, John Bally, and Perry Hacking*. **322**, 770, 148-C5 (1987)
- BLACKWELL, A. T. Evidence from Meteor Patrol Photographs for a Nonastrophysical Origin of the Reported Optical Flashes in Perseus. *I. Halliday, P. A. Feldman, and A. T. Blackwell*. **320**, L153, 121-F11 (1987)
- BLADES, J. CHRIS. Recent Massive Star Formation in 30 Doradus. *Nolan R. Walborn and J. Chris Blades*. **323**, L65, 158-E6 (1987)
- BLAES, O. M. A New Example of the Papaloizou-Pringle Instability. *M. A. Abramowicz, O. M. Blaes, and P. Ghosh*. **323**, 629, 161-E10 (1987)
- BLAIR, WILLIAM P. Discovery of Fast-moving Nitrogen-rich Ejecta in the Supernova Remnant Cassiopeia A. *Robert A. Fesen, Robert H.*

- Becker, and William P. Blair. 313, 378, 19-B3 (1987)
- BLAKE, GEOFFREY A. Comparison of Submillimeter and Ultraviolet Observations of Neutral Carbon toward Zeta Ophiuchi. *Jocelyn Keene, Geoffrey A. Blake, and T. G. Phillips*. 313, 396, 19-D1 (1987)
- Molecular Abundances in OMC-1: The Chemical Composition of Interstellar Molecular Clouds and the Influence of Massive Star Formation. *Geoffrey A. Blake, E. C. Sutton, C. R. Masson, and T. G. Phillips*. 315, 621, 47-D9 (1987)
- Laboratory Measurement of the Pure Rotational Spectrum of Vibrationally Excited HCO^+ ($v=1$) by Far-Infrared Laser Sideband Spectroscopy. *Geoffrey A. Blake, K. B. Laughlin, R. C. Cohen, Kerry L. Busarow, and R. J. Saykally*. 316, 145, 56-D7 (1987)
- BLANCO, V. IRAS 18059 - 3211: Optically Known As Gomez's Hamburger: Erratum. *M. T. Ruiz, V. Blanco, J. Maza, S. Heathcote, A. Phillips, K. Kawara, C. Anguita, M. Hamuy, and A. Gomez*. 320, L157, 121-F14 (1987) (Orig. paper in 316, L21, 56-B10)
- BLANCO, V. M. Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. *V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storchi-Bergmann, and J. Matthews*. 320, 589, 116-B3 (1987)
- BLANCO, VICTOR. IRAS 1809 - 3211: Optically Known as "Gomez's Hamburger". *Maria Teresa Ruiz, Victor Blanco, José Maza, Steve Heathcote, Andrew Phillips, Kimiaki Kawara, Claudio Anguita, Mario Hamuy, and Arturo Gómez*. 316, L21, 56-B10 (1987)
- BLANDFORD, R. D. 1146 + 1118C: A Giant Gravitational Lens? *R. D. Blandford, E. S. Phinney, and R. Narayan*. 313, 28, 15-C6 (1987)
- BLANDFORD, ROGER D. Gravitational Imaging by Isolated Elliptical Potential Wells. I. Cross Sections. *Roger D. Blandford and Christopher S. Kochanek*. 321, 658, 131-F1 (1987)
- Gravitational Imaging by Isolated Elliptical Potential Wells. II. Probability Distributions. *Christopher S. Kochanek and Roger D. Blandford*. 321, 676, 132-A3 (1987)
- BLEWITT, G. see SVOBODA, R. et al.
- BLITZ, LEO. A New Assault on the 92 Centimeter Line of D I. *Leo Blitz and Carl Heiles*. 313, L95, 27-E9 (1987)
- BLOEMEN, HANS. A Gamma-Ray Constraint on the Nature of Dark Matter. *Joseph Silk and Hans Bloemen*. 313, L47, 27-B5 (1987)
- BLOEMEN, J. B. G. M. High-Energy Gamma Rays Probing Cosmic-Ray Spectral Differences throughout the Galaxy. *J. B. G. M. Bloemen*. 317, L15, 71-B5 (1987)
- On Stable Hydrostatic Equilibrium Configurations of the Galaxy and Implications for Its Halo. *J. B. G. M. Bloemen*. 322, 694, 147-D1 (1987)
- BLONDIN, JOHN M. Pair-Creation Effects in Accretion Shock Models of Active Galactic Nuclei. *John M. Blondin and Arieh Königl*. 323, 451, 159-E1 (1987)
- BLUDMAN, S. A. The Effects of Neutrino Transport on the Collapse of Iron Stellar Cores. *E. S. Myra, S. A. Bludman, Y. Hoffman, I. Lichenstadt, N. Sack, and K. A. Van Riper*. 318, 744, 89-B2 (1987)
- BODE, M. F. IRAS Observations of Collisionally Heated Dust in Large Magellanic Cloud Supernova Remnants. *James R. Graham, A. Evans, J. S. Albinson, M. F. Bode, and W. P. S. Meikle*. 319, 126, 94-D5 (1987)
- BODENHEIMER, PETER H. The Crucial Role of Cooling in the Making of Molecular Clouds and Stars. *Joel E. Tohline, Peter H. Bodenheimer, and Dimitris M. Christodoulou*. 322, 787, 148-D9 (1987)
- BODO, G. Current-driven Magnetohydrodynamic Thermal Instabilities in Sheared Fields. *G. Bodo, A. Ferrari, S. Massaglia, and R. Rosner*. 313, 432, 19-F10 (1987)
- On the Thermal Instability of Galactic and Cluster Halos. *A. Malagoli, R. Rosner, and G. Bodo*. 319, 622, 101-G8 (1987)
- BOER, M. Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. *J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Koweliotou, T. Cline, B. Dennis, U. Desai, and L. Orwig*. 320, L105, 121-C7 (1987)
- A New Type of Repetitive Behavior in a High-Energy Transient. *J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Koweliotou, T. L. Cline, B. R. Dennis, U. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. 320, L111, 121-C13 (1987)
- SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806 - 20. *C. Koweliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. 322, L21, 145-B8 (1987)
- BOERCKER, DAVID B. Collective Effects on Thomson Scattering in the Solar Interior. *David B. Boercker*. 316, L95, 62-D12 (1987)
- BOESGAARD, ANN M. Lithium in F Stars of Known Age. *Ann M. Boesgaard and Michael J. Tripicco*. 313, 389, 19-C8 (1987)
- BOESGAARD, ANN MERCHANT. Lithium in the Coma Cluster. *Ann Merchant Boesgaard*. 321, 967, 135-B3 (1987)
- BOGDAN, T. J. Propagation of Compressive Waves through Fibril Magnetic Fields. *T. J. Bogdan and Ellen G. Zweibel*. 312, 444, 5-F10 (1987)
- Propagation of Compressive Waves through Fibril Magnetic Fields. II. Scattering from a Slab of Magnetic Flux Tubes. *T. J. Bogdan*. 318, 888, 90-F4 (1987)
- Propagation of Compressive Waves through Fibril Magnetic Fields. III. Waves that Propagate along the Magnetic Field. *T. J. Bogdan*. 318, 896, 90-F12 (1987)
- Energetic Particle Acceleration in Spherically Symmetric Accretion Flows and Shocks. *G. M. Webb and T. J. Bogdan*. 320, 683, 117-C4 (1987)
- BOHLENDER, DAVID A. Magnetic Field Measurements of Helium-strong Stars. *David A. Bohlender, Douglas N. Brown, J. D. Landstreet, and Ian B. Thompson*. 323, 325, 156-E8 (1987)
- BOHLIN, R. C. The Unusual Dust-scattering Properties in the Reflection Nebula CED 201. *A. N. Witt, R. C. Bohlin, T. P. Stecher, and S. M. Graff*. 321, 912, 134-E4 (1987)
- BÖHM, K. H. Ultraviolet Spectra of HH 1 and HH 2: Spatial Variations and the Continuum Problem. *K. H. Böhm, Th. Bührke, A. C. Raga, E. W. Brugel, A. N. Witt, and R. Mundt*. 316, 349, 53-G7 (1987)
- Time-dependent Bow Shocks and the Condensation Structure of Herbig-Haro Objects. *A. C. Raga and K. H. Böhm*. 323, 193, 155-B10 (1987)
- BÖHM-VITENSE, ERIKA. Theory of Transition-Layer Emission Measures and Coronae. *Erika Böhm-Vitense*. 317, 750, 74-C2 (1987)
- BÖHRINGER, H. Characteristics of Old Neutron Stars in Dense Interstellar Clouds. *H. Böhringer, G. E. Morfill, and H. U. Zimmermann*. 313, 218, 17-D1 (1987)
- BOICE, D. C. Polyoxymethylene in Comet Halley. *W. F. Huebner, D. C. Boice, and C. M. Sharp*. 320, L149, 121-F7 (1987)
- BOKSENBURG, A. A Detailed Study of the C IV $\lambda 1550$ Line Profile and Adjacent Spectral Features in NGC 4151 from 1978 to 1983. *J. Clavel, A. Altamore, A. Bokseburg, G. E. Bromage, A. Elvius, D. Pelat, M. V. Penston, G. C. Perola, M. A. J. Snijders, and M. H. Ulrich*. 321, 251, 125-A5 (1987)
- High-Resolution Spectra of 24 Low-Redshift QSOs: The Properties of Mg II Absorption Systems. *David Tytler, A. Bokseburg, Wallace L. W. Sargent, Peter Young, and Daniel Kunth*. 64, 667, 27-B8 (1987) (Abstr. in 318, 945, 91-C10)
- BOLDT, ELIHU. Constraints on Possible Precursor AGN Sources of the Cosmic X-Ray Background. *Elihu Boldt and Darryl Leiter*. 322, L1, 145-A4 (1987)
- BOLTE, MICHAEL. Main-Sequence CCD Photometry of the Globular Cluster NGC 362. *Michael Bolte*. 315, 469, 45-G6 (1987)
- Deep CCD Photometry of the Globular Cluster NGC 7099. *Michael Bolte*. 319, 760, 103-D1 (1987)
- The Low-Luminosity X-Ray Sources in Omega Centauri. *Bruce Margon and Michael Bolte*. 321, L61, 129-F11 (1987)
- BOND, HOWARD E. Nitrogen and Sulfur Overabundances in the Population II Supergiant HD 46703. *Howard E. Bond and R. Earle Luck*. 312, 203, 3-B10 (1987)
- PG 0122 + 200: A New Member of the GW Virginis (PG 1159 - 035) Class of Extremely Hot Pulsating White Dwarfs. *Howard E. Bond and Albert D. Grauer*. 321, L123, 137-C1 (1987)
- A Search for Pulsating Stars Similar to PG 1159 - 035 and K1-16. *Albert D. Grauer, Howard E. Bond, James Liebert, Thomas A. Fleming, and Richard F. Green*. 323, 271, 156-A10 (1987)
- BOND, J. R. Cosmic Fluctuation Spectra with Large-Scale Power. *J. M. Bardeen, J. R. Bond, and G. Efstathiou*. 321, 28, 122-D1 (1987)
- BONNER, W. B. Average Density in Cosmology. *W. B. Bonner*. 316, 49, 50-E7 (1987)
- BONOMETTI, R. J. VLBI Observations of 23 Hot Spots in the Starburst Galaxy M82. *N. Bartel, M. I. Ratner, A. E. E. Rogers, I. I. Shapiro, R. J. Bonometti, N. L. Cohen, M. V. Gorenstein, J. M. Marcaide, and R. A. Preston*. 323, 505, 160-B3 (1987)
- BONOMETTO, SILVIO A. Optical Bias and Hierarchical Clustering. *Silvio A. Bonometto, Francesco Lucchin, and Sabino Matarrese*. 323, 19, 153-C6 (1987)
- BOOKBINDER, J. Einstein Observatory Survey of X-Ray Emission from Solar-Type Stars: The Late F and G Dwarf Stars. *A. Maggio, S. Sciortino, G. S. Vaiana, P. Majer, J. Bookbinder, L. Golub, F. R. Harnden, Jr., and R. Rosner*. 315, 687, 48-B8 (1987)
- BOOKBINDER, J. A. Discovery of Radio Emission from AE Aquarii. *J. A. Bookbinder and D. Q. Lamb*. 323, L131, 164-D7 (1987)
- BOOTH, ROY S. Multifrequency VLBI Observations of 4C 39.25: A Superluminal Source without a Well-defined Core. *Alan P. Marscher,*

- David B. Shafer, Roy S. Booth, and Barry J. Geldzahler. **319**, L69, 107-D7 (1987)
- BOOTHROYD, ARNOLD I. On the Origin of the Solar System s-Process Abundances. Robert A. Malaney and Arnold I. Boothroyd. **320**, 866, 119-C7 (1987)
- BOPP, BERNARD W. "Marginal" BY Draconis Stars. Bernard W. Bopp. **317**, 781, 74-E8 (1987)
- BOREIKO, R. T. Ground-based Observations of IRAS Candidates for Late Asymptotic Giant Branch Stars. Sun Kwok, Bruce J. Hrivnak, and R. T. Boreiko. **312**, 303, 4-B14 (1987)
- Solar Brightness Temperature at Submillimeter Wavelengths. R. T. Boreiko and T. A. Clark. **318**, 445, 83-G2 (1987)
- Ground-based Infrared Observations of Variable IRAS Sources as Candidates for Late Asymptotic Giant Branch Stars. Sun Kwok, Bruce J. Hrivnak, and R. T. Boreiko. **321**, 975, 135-B11 (1987)
- BORGHESE, A. Amorphous Carbon and the Unidentified Infrared Bands. A. Borghesi, E. Bussoletti, and L. Colangeli. **314**, 422, 32-G2 (1987)
- BORIAKOFF, V. Comet Halley: OH Absorption of Galactic Background Radio Sources. E. Bajaja, E. M. Arnal, J. C. Cerosimo, F. R. Colomb, M. C. Martin, J. Mazzaro, R. Morras, J. C. Olalde, W. G. L. Pöppel, A. M. Silva, I. F. Mirabel, and V. Boriakoff. **313**, 906, 26-F2 (1987)
- Observation of the OH 1667 MHz Line toward Comet Halley from the Southern Hemisphere. E. Bajaja, R. Morras, W. G. L. Pöppel, J. E. Cerosimo, M. C. Martin, J. Mazzaro, J. C. Olalde, A. Silva, E. M. Arnal, F. R. Colomb, I. F. Mirabel, and V. Boriakoff. **322**, 549, 144-A1 (1987)
- BORNEMANN, P. L. Turbulence as a Contributor to Intermediate Energy Storage during Solar Flares. P. L. Bornemann. **313**, 449, 19-G13 (1987)
- BORUTZKI, SUSAN E. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. John D. Anderson, Timothy P. Krisher, Susan E. Borutzki, Michael J. Connally, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen. **323**, L141, 164-E1 (1987)
- BORYSOW, ALEXANDRA. Collision-induced Rototranslational Absorption Spectra of CH₄-CH₄ Pairs at Temperatures from 50 to 300 K. Aleksandra Borysow and Lothar Frommhold. **318**, 940, 91-C2 (1987)
- Collision-induced Rototranslational Absorption Spectra of N₂-N₂ Pairs for Temperatures from 50 to 300 K: Erratum. Aleksandra Borysow and Lothar Frommhold. **320**, 437, 112-G4 (1987) (Orig. paper in **311**, 1043, 160-C6)
- BOSS, ALAN P. Bipolar Flows, Molecular Gas Disks, and the Collapse and Accretion of Rotating Interstellar Clouds. Alan P. Boss. **316**, 721, 60-A6 (1987)
- Protostellar Formation in Rotating Interstellar Clouds. VI. Nonuniform Initial Conditions. Alan P. Boss. **319**, 149, 94-F2 (1987)
- BOTHUN, G. Isophotal Diameters of Cluster Spirals. M. E. Cornell, M. Aaronson, G. Bothun, and J. Mould. **64**, 507, 24-A5 (1987) (Abstr. in **317**, 1002, 77-B5)
- BOTHUN, GREGORY D. Sources of Error in the Tully-Fisher Relation: Reducing the Scatter with CCD i-Band Surface Photometry of Spiral Galaxies. Gregory D. Bothun and Jeremy R. Mould. **313**, 629, 23-F1 (1987)
- BOUCHER, PATRICK. Hydrostatic Confinement of Radio Jets. Kayll Lake and Patrick Boucher. **314**, 507, 34-B2 (1987)
- BOULANGER, F. Giant Molecular Clouds in M31. S. N. Vogel, F. Boulanger, and R. Ball. **321**, L145, 137-D8 (1987)
- BOURGERET, J.-L. Radio Evidence for a Magnetic Mirror Effect on Beams of Subrelativistic Electrons in the Solar Corona. C. Caroubalos, M. Poquérusse, J.-L. Bourgeret, and R. Crépel. **319**, 503, 98-F7 (1987)
- BOWERS, P. F. Detection of H I Emission from the Circumstellar Envelope of Alpha Orionis. P. F. Bowers and G. R. Knapp. **315**, 305, 43-C4 (1987)
- H₂O Masers in Circumstellar Envelopes. Adair P. Lane, K. J. Johnston, P. F. Bowers, J. H. Spencer, and P. J. Diamond. **323**, 756, 163-A8 (1987)
- BOWYER, STUART. Simultaneous Multifrequency Observations of Markarian 421. Jean Brodie, Stuart Bowyer, and Allyn Tennant. **318**, 175, 80-G5 (1987)
- BOYD, L. J. Discovery of Optical Circular Polarization in Lambda Andromedae. J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook. **317**, L29, 71-C2 (1987)
- BOYD, R. N. Photoerosion of Nuclei in Quasar Emission-Line Regions. R. N. Boyd and G. J. Ferland. **318**, L21, 85-B8 (1987)
- BOYNTON, P. E. Apical Advance in Vela X-1. J. E. Deeter, P. E. Boynton, F. K. Lamb, and G. Zylstra. **314**, 634, 36-E1 (1987)
- BRADLEY, STEVEN E. Emission-Line Variability and the Broad-Line Region of Quasi-stellar Objects. I. Time Scales and Photon Densities. Wei Zheng, E. Margaret Burbidge, Harding E. Smith, Ross D. Cohen, and Steven E. Bradley. **322**, 164, 139-F5 (1987)
- BRADSTREET, DAVID H. V677 Centauri: Overcontact and Completely Eclipsing but A-Type or W-Type? Pamela M. Kilmartin, David H. Bradstreet, and Robert H. Koch. **319**, 334, 96-E12 (1987)
- BRADT, H. V. Discovery of Three New RS Canum Venaticorum-like Counterparts to HEAO 1 X-Ray Sources. D. A. H. Buckley, I. R. Tuohy, R. A. Remillard, H. V. Bradt, and D. A. Schwartz. **315**, 273, 42-G14 (1987)
- BRAGE, T. Ultraviolet Doubly Excited Fe II Lines in the Laboratory and in the A-Type Star 21 Pegasi. J. Adam, B. Baschek, S. Johansson, A. E. Nilsson, and T. Brage. **312**, 337, 4-E6 (1987)
- BRAINERD, J. Effect of an Electron Scattering Cloud on X-Ray Oscillations Produced by Beaming. J. Brainerd and F. K. Lamb. **317**, L33, 71-C6 (1987)
- BRAINERD, J. J. Synchrotron Emission and Gamma-Ray Bursts. J. J. Brainerd and D. Q. Lamb. **313**, 231, 17-D14 (1987)
- Analytic and Numerical Calculations of Quantum Synchrotron Spectra from Relativistic Electron Distributions. J. J. Brainerd and V. Petrosian. **320**, 703, 117-D11 (1987)
- Quantum Synchrotron Spectra from Semirelativistic Electrons in Teragauss Magnetic Fields. J. J. Brainerd. **320**, 714, 117-E8 (1987)
- BRANCH, DAVID. High-Velocity Matter in a Classical Type I Supernova: The Demise of Type Ia Homogeneity. David Branch. **316**, L81, 62-C11 (1987)
- Blackbody Emissivity of Supernova 1987A and the Extragalactic Distance Scale. David Branch. **320**, L23, 114-C1 (1987)
- Supernova 1987A: LTE Line Strengths as a Guide to Line Identifications. David Branch. **320**, L121, 121-D8 (1987)
- BRAND, P. see SVOBODA, R. et al.
- BRAND, PETER. Fluorescent Molecular Hydrogen Emission from the Reflection Nebula NGC 2023. Ian Gatley, Tetsuo Hasegawa, Hiroko Suzuki, Ron Garden, Peter Brand, John Lightfoot, William Glencross, Haruyuki Okuda, and Tetsuya Nagata. **318**, L73, 92-D4 (1987)
- BRAND, PETER W. J. Level Population and Para/Ortho Ratio of Fluorescent H₂ in NGC 2023. Tetsuo Hasegawa, Ian Gatley, Ron P. Garden, Peter W. J. L. Brand, Masatoshi Ohishi, Masahiko Hayashi, and Norio Kaifu. **318**, L77, 92-D12 (1987)
- BRANDENBERGER, ROBERT. Cosmic String Waves. Albert Stebbins, Shoba Veeraraghavan, Robert Brandenberger, Joseph Silk, and Neil Turok. **322**, 1, 138-A7 (1987)
- BRATTON, C. B. see SVOBODA, R. et al.
- BRAULT, JAMES W. On the Apparent Velocity of Integrated Sunlight. I. 1983-1985. Drake Denning, Fred Espenak, Donald E. Jennings, James W. Brault, and Jeremy Wagner. **316**, 771, 60-E4 (1987)
- BRAUN, D. A Solar Chromosphere and Spicule Model Based on Far-Infrared Limb Observations. D. Braun and C. Lindsey. **320**, 898, 119-E11 (1987)
- BRAUN, D. C. Acoustic Absorption by Sunspots. D. C. Braun, T. L. Duwall, Jr., and B. J. LaBonte. **319**, L27, 100-C9 (1987)
- BRECHER, KENNETH. Electromagnetic Cascades in the Magnetosphere of a Very Young Pulsar: A Model for the Positron Production near the Galactic Center. Apostolos Mastichiadis, Kenneth Brecher, and Alan P. Marscher. **314**, 88, 29-A5 (1987)
- BREGER, MICHEL. The Pleiades Cluster. IV. The Visit of a Molecular CO Cloud. Michel Breger. **319**, 754, 103-C9 (1987)
- BREGMAN, J. N. The Ultraviolet Spectra of Intermediate-Redshift Quasars. II. A. L. Kinney, P. J. Huggins, A. E. Glassgold, and J. N. Bregman. **314**, 145, 29-E7 (1987)
- BRICKHOUSE, NANCY S. O 4774 Diagnostic for Quiescent Prominences. Nancy S. Brickhouse and Donald A. Landman. **313**, 463, 20-A13 (1987)
- BRIGHTMAN, D. R. The Hydrogen Molecular Ion in an Arbitrary Homogeneous Magnetic Field. D. R. Brightman and J. M. Wadehra. **317**, 865, 75-D14 (1987)
- BRODERICK, JOHN J. 18 Centimeter VLBI Observations of the Quasar NRAO 140 during and after a Low-Frequency Outburst. Alan P. Marscher, John J. Broderick, Lucia Padrielli, Norbert Bartel, and Jonathan D. Romney. **319**, 456, 98-B8 (1987)
- BRODIE, JEAN. Simultaneous Multifrequency Observations of Markarian 421. Jean Brodie, Stuart Bowyer, and Allyn Tennant. **318**, 175, 80-G5 (1987)
- BROMAGE, G. E. A Detailed Study of the C IV λ 1550 Line Profile and Adjacent Spectral Features in NGC 4151 from 1978 to 1983. J. Clavel, A. Altamore, A. Boksenberg, G. E. Bromage, A. Elvijs, D. Pelat, M. V. Penston, G. C. Perola, M. A. J. Snijders, and M. H. Ulrich. **321**, 251, 125-A5 (1987)
- BRONFMAN, L. A Large Molecular Cloud in Lupus Far From the Galactic Plane. L.-A. Nyman, P. Thaddeus, L. Bronfman, and R. S. Cohen. **314**, 374, 32-C4 (1987)

- Molecular Clouds in the Carina Arm: Large-Scale Properties of Molecular Gas and Comparison with H I. D. A. Grabelsky, R. S. Cohen, L. Bronfman, P. Thaddeus, and J. May. **315**, 122, 41-D2 (1987)
- BROOKS, JOHN J. The Perseus Flasher and Satellite Glints. Bradley E. Sclafner, Michael Barber, John J. Brooks, Allen DeForest, Paul D. Maley, Norman W. McLeod III, Russ McNiel, Andrew J. Noymer, A. K. Presnell, Richard Schwartz, and Scott Whitney. **320**, 398, 112-D2 (1987)
- BROTEN, N. W. Observations of OCS and a Search for OCS in the Interstellar Medium. H. E. Matthews, J. M. MacLeod, N. W. Broten, S. C. Madden, and P. Friberg. **315**, 646, 47-F7 (1987)
- BROWN, A. X-Ray Sources in Regions of Star Formation. II. The Pre-Main-Sequence G Star HDE 283572. F. M. Walter, A. Brown, J. L. Linsky, A. E. Rydgren, F. Vrba, M. Roth, L. Carrasco, P. F. Chugainov, N. I. Shakouskaya, and C. L. Imhoff. **314**, 297, 31-D2 (1987)
- BROWN, ALEXANDER. Variable Radio Emission from the 4 Draconis System. Alexander Brown. **312**, L51, 14-C7 (1987)
- Radio Emission from Pre-Main-Sequence Stars in Corona Australis. Alexander Brown. **322**, L31, 145-C3 (1987)
- BROWN, B. L. Galactic Center Positronium Fraction: Observations and Simulations. B. L. Brown and M. Leventhal. **319**, 637, 102-A1 (1987)
- BROWN, DOUGLAS N. Magnetic Field Measurements of Helium-strong Stars. David A. Bohlender, Douglas N. Brown, J. D. Landstreet, and Ian B. Thompson. **323**, 325, 156-E8 (1987)
- The Evolution of the Magnetic Fields of Ap Stars: Magnetic Observations of Stars in the Scorpius-Centaurus Association. Ian B. Thompson, Douglas N. Brown, and John D. Landstreet. **64**, 219, 19-B11 (1987) (Abstr. in **315**, 732, 48-E13)
- BROWN, G. E. Convection in Supernova Theory. H. A. Bethe, G. E. Brown, and J. Cooperstein. **322**, 201, 140-B3 (1987)
- BROWN, JEFFERY A. Carbon-to-Nitrogen Ratios along the Evolutionary Sequence of M67. Jeffery A. Brown. **317**, 701, 73-F7 (1987)
- BROWN, M. E. The Local Extragalactic Velocity Field, the Local Mean Mass Density, and Biased Galaxy Formation. M. E. Brown and P. J. E. Peebles. **317**, 588, 72-E6 (1987)
- BROWN, TIMOTHY M. Depth and Latitude Dependence of Solar Rotation. Timothy M. Brown and Cheryl Lynn A. Morrow. **314**, L21, 33-C8 (1987)
- BROWN, W. L. Experimental Study of Erosion of Methane Ice by Energetic Ions and Some Considerations for Astrophysics. L. J. Lanzerotti, W. L. Brown, and K. J. Marcantonio. **313**, 910, 26-F7 (1987)
- BRUGEL, E. W. Ultraviolet Spectra of HH 1 and HH 2: Spatial Variations and the Continuum Problem. K. H. Böhm, Th. Bührke, A. C. Raga, E. W. Brugel, A. N. Witt, and R. Mundt. **316**, 349, 53-G7 (1987)
- BRUGEL, EDWARD W. Jets from Young Stars: CCD Imaging, Long-Slit Spectroscopy, and Interpretation of Existing Data. Reinhard Mundt, Edward W. Brugel, and Thomas Bührke. **319**, 275, 96-A6 (1987)
- BRUHWEILER, FREDERICK C. Deep Einstein X-Ray Imagery of the Small Magellanic Cloud. Frederick C. Bruhweiler, Daniel A. Klingensmith III, Theodore R. Gull, and Sabatino Sofia. **317**, 152, 65-E11 (1987)
- BRUNEL, F. Current Loop Coalescence Model of Solar Flares. T. Tajima, J. Sakai, H. Nakajima, T. Kosugi, F. Brunel, and M. R. Kundu. **321**, 1031, 135-F11 (1987)
- BRUNISH, WENDEE M. A Comparison between Mass-losing and Standard Solar Models. Joyce A. Guzik, L. A. Willson, and Wendee M. Brunish. **319**, 957, 105-D5 (1987)
- BUCHLER, J. R. Application of Time-dependent Fourier Analysis to Nonlinear Pulsational Stellar Models. G. Kovács, J. R. Buchler, and C. G. Davis. **319**, 247, 95-F6 (1987)
- BUCHLER, J. ROBERT. Modal Selection in Stellar Pulsators. II. Application to RR Lyrae Models. J. Robert Buchler and Géza Kovács. **318**, 232, 81-D7 (1987)
- Period Doubling Bifurcations and Chaos in W Virginis Models. J. Robert Buchler and Géza Kovács. **320**, L57, 114-E3 (1987)
- BUCKLEY, D. A. H. Discovery of Three New RS Canum Venaticorum-like Counterparts to HEAO 1 X-Ray Sources. D. A. H. Buckley, I. R. Tuohy, R. A. Remillard, H. V. Bradt, and D. A. Schwartz. **315**, 273, 42-G14 (1987)
- BUDDING, E. An Analysis of the Light Curves of Short-Period RS Canum Venaticorum Stars: Starspots and Fundamental Properties. E. Budding and M. Zeilik. **319**, 827, 104-A12 (1987)
- BUDGE, KENT G. An Improved Henyey Method for Calculating Stellar Models. Kent G. Budge. **312**, 217, 3-C10 (1987)
- BÖHRKE, TH. Ultraviolet Spectra of HH 1 and HH 2: Spatial Variations and the Continuum Problem. K. H. Böhm, Th. Bührke, A. C. Raga, E. W. Brugel, A. N. Witt, and R. Mundt. **316**, 349, 53-G7 (1987)
- BÖHRKE, THOMAS. Jets from Young Stars: CCD Imaging, Long-Slit Spectroscopy, and Interpretation of Existing Data. Reinhard Mundt, Edward W. Brugel, and Thomas Bührke. **319**, 275, 96-A6 (1987)
- BURBIDGE, E. MARGARET. Spectrophotometry of Six Broad Absorption Line QSOs. Vesa T. Junkkarinen, E. Margaret Burbidge, and Harding E. Smith. **317**, 460, 69-A7 (1987)
- The Nature of the BL Lacertae Object AO 0235 + 164. Ross D. Cohen, Harding E. Smith, Vesa T. Junkkarinen, and E. Margaret Burbidge. **318**, 577, 87-C1 (1987)
- Emission-Line Variability and the Broad-Line Region of Quasi-stellar Objects. I. Time Scales and Photon Densities. Wei Zheng, E. Margaret Burbidge, Harding E. Smith, Ross D. Cohen, and Steven E. Bradley. **322**, 164, 139-F5 (1987)
- BURBIDGE, G. A New Optical Catalog of Quasi-stellar Objects. A. Hewitt and G. Burbidge. **63**, 1, 1-A5 (1987) (Abstr. in **311**, 1076, 160-E12)
- BURKE, B. F. The Triple Radio Source 0023 + 171: A Candidate for a Dark Gravitational Lens. J. N. Hewitt, E. L. Turner, C. R. Lawrence, D. P. Schneider, J. E. Gunn, C. L. Bennett, B. F. Burke, J. H. Mahoney, G. I. Langston, M. Schmidt, J. B. Oke, and J. G. Hoessel. **321**, 706, 132-C5 (1987)
- BURNELL, J. see MAKINO, F., et al.
- BURNS, JACK O. B2 0800 + 24: A Narrow-Angle Tail Radio Galaxy in a Small Group of Galaxies. John T. Stocke and Jack O. Burns. **319**, 671, 102-C8 (1987)
- Comparisons of the Spatial Distribution of Abell Clusters against Models with Gaussian Initial Conditions. David J. Butusi, Adrian L. Melott, and Jack O. Burns. **322**, 48, 138-D12 (1987)
- BURNS, M. S. Optical Color, Polarimetric, and Timing Measurements of the 50 Millisecond Large Magellanic Cloud Pulsar, PSR 0540 - 69. J. Middleditch, C. R. Pennypacker, and M. S. Burns. **315**, 142, 41-E8 (1987)
- BURROWS, ADAM. Convection and the Mechanism of Type II Supernovae. Adam Burrows. **318**, L57, 92-C3 (1987)
- Neutrinos from SN 1987A. Adam Burrows and James M. Lattimer. **318**, L63, 92-C8 (1987)
- BURROWS, CHRISTOPHER. Broad-Band Imaging of the Beta Pictoris Circumstellar Disk. Francesco Paresce and Christopher Burrows. **319**, L23, 100-C1 (1987)
- BURROWS, D. N. A 9 Month Long Soft X-Ray Survey of the Large Magellanic Cloud. I. X-Ray Map at 1/4 keV. K. P. Singh, J. A. Nousek, D. N. Burrows, and G. P. Garmire. **313**, 185, 17-A7 (1987)
- BURSTEIN, DAVID. Spectroscopy and Photometry of Elliptical Galaxies. I. New Distance Estimator. Alan Dressler, Donald Lynden-Bell, David Burstein, Roger L. Davies, S. M. Faber, Roberto Terlevich, and Gary Wegner. **313**, 42, 15-D7 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies: A Large-Scale Streaming Motion in the Local Universe. Alan Dressler, S. M. Faber, David Burstein, Roger L. Davies, Donald Lynden-Bell, R. J. Terlevich, and Gary Wegner. **313**, L37, 27-A9 (1987)
- The Relationship between Stellar Population and Radio Continuum Emission in Spiral Galaxies. David Burstein, J. J. Condon, and Q. F. Yin. **315**, L99, 49-C8 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies. II. The Spectroscopic Parameters. Roger L. Davies, David Burstein, Alan Dressler, S. M. Faber, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner. **64**, 581, 26-B1 (1987) (Abstr. in **318**, 944, 91-C9)
- Spectroscopy and Photometry of Elliptical Galaxies. III. UBV Aperture Photometry, CCD Photometry, and Magnitude-related Parameters. David Burstein, Roger L. Davies, Alan Dressler, S. M. Faber, Remington P. S. Stone, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner. **64**, 601, 26-C7 (1987) (Abstr. in **318**, 944, 91-C9)
- A 1.49 GHz Supplementary Atlas of Spiral Galaxies with H-Magnitudes. J. J. Condon, Q. F. Yin, and David Burstein. **65**, 543, 36-G1 (1987) (Abstr. in **322**, 1075, 151-G1)
- BUSAROW, KERRY L. Laboratory Measurement of the Pure Rotational Spectrum of Vibrationally Excited HCO⁺ ($v = 1$) by Far-Infrared Laser Sideband Spectroscopy. Geoffrey A. Blake, K. B. Laughlin, R. C. Cohen, Kerry L. Busarow, and R. J. Saykally. **316**, L45, 56-D7 (1987)
- BUSHOUSE, HOWARD A. Global Properties of Interacting Disk-Type Galaxies. Howard A. Bushouse. **320**, 49, 108-E4 (1987)
- BUSNARDO-NETO, J. Cerenkov Damping of Surface Waves. Altair S. Assis and J. Busnardo-Neto. **323**, 399, 157-D10 (1987)
- BUSS, RICHARD H., JR. Extinction and Abundance Properties of Alpha Scorpii Circumstellar Grains. Theodore P. Snow, Jr., Richard H. Buss, Jr., D. P. Gilra, and J. P. Swings. **321**, 921, 134-E13 (1987)
- BUSSOLETTI, E. Amorphous Carbon and the Unidentified Infrared Bands. A. Borghesi, E. Bussoletti, and L. Colangeli. **314**, 422, 32-G2 (1987)
- Interstellar Amorphous Carbon. E. Bussoletti, L. Colangeli, and V. Orfino. **321**, L87, 130-A7 (1987)
- BUST, GARY S. Were the Lyman- α Clouds Formed from Shocks? Ethan T. Vishniac and Gary S. Bust. **319**, 14, 93-B7 (1987)
- BUTA, R. The Structure and Dynamics of Ringed Galaxies. III. Surface Photometry and Kinematics of the Ringed Nonbarred Spiral NGC 7531. R. Buta. **64**, 1, 17-A5 (1987) (Abstr. in **315**, 730, 48-E11)

- The Structure and Dynamics of Ringed Galaxies. IV. Surface Photometry and Kinematics of the Ringed Barred Spiral NGC 6300. *R. Buta*. **64**, 383, 22-A5 (1987) (Abstr. in **316**, 859, 61-F1)
- BUTLER, R. PAUL. The Pleiades Rapid Rotators: Evidence for an Evolutionary Sequence. *R. Paul Butler, Ross D. Cohen, Douglas K. Duncan, and Geoffrey W. Marcy*. **319**, L19, 100-B9 (1987)
- BUZASI, DEREK L. A Flare Event on the Long-Period RS Canum Venaticorum System IM Pegasi. *Derek L. Buzasi, Lawrence W. Ramsey, and David P. Huenemoerder*. **322**, 353, 141-F8 (1987)
- CABRIT, SYLVIE. Forbidden Line and H α Profiles in T Tauri Star Spectra: A Probe of Anisotropic Mass Outflows and Circumstellar Disks. *Suzan Edwards, Sylvie Cabrit, Stephen E. Strom, Ingeborg Heyer, Karen M. Strom, and E. Anderson*. **321**, 473, 127-C10 (1987)
- CAFFEE, M. W. Evidence in Meteorites for an Active Early Sun. *M. W. Caffee, C. M. Hohenberg, T. D. Swindle, and J. N. Goswami*. **313**, L31, 21-C3 (1987)
- CAHEN, S. Light Curves of Exploding Wolf-Rayet Stars. *R. Schaeffer, M. Cassé, and S. Cahen*. **316**, L31, 56-C8 (1987)
- CAMPBELL, BEL. Radio Emission from the Nova-like Variable AC Cancri and the Symbiotic Variable AG Draconis. *Michael V. Torbett and Bel Campbell*. **318**, L29, 85-C2 (1987)
- CAMPBELL, BRUCE. Spectroscopy of the $\lambda 7699$ K I Line among Globular Cluster Giants. *Bruce Campbell and Graeme H. Smith*. **323**, L69, 158-E11 (1987)
- CAMPINS, HUMBERTO. The Bare Nucleus of Comet Neujmin 1. *Humberto Campins, Michael F. A'Hearn, and Lucy-Ann McFadden*. **316**, 847, 61-D1 (1987)
- CANFIELD, E. Inverse Comptonization by One-dimensional Relativistic Electrons. *E. Canfield, W. M. Howard, and E. P. Liang*. **323**, 565, 161-A1 (1987)
- CANFIELD, RICHARD C. The H α Spectral Counterparts of Solar Hard X-Rays Microflares. *Richard C. Canfield and Thomas R. Metcalf*. **321**, 586, 128-E2 (1987)
- Impulsive H α Diagnostics of Electron-Beam-Heated Solar Flare Model Chromospheres. *Richard C. Canfield and Kenneth G. Gayley*. **322**, 999, 150-G10 (1987)
- CANIZARES, CLAUDE R. Properties of the X-Ray Emitting Gas in Early-Type Galaxies. *Claude R. Canizares, Giuseppina Fabbiano, and Ginevra Trinchieri*. **312**, 503, 8-D5 (1987)
- CANNIZZO, JOHN K. A Linear Thermal Stability Analysis for the Vertical Structure of Alpha Model Accretion Disks. *Hideyuki Saio, John K. Cannizzo, and J. Craig Wheeler*. **316**, 716, 60-A1 (1987)
- The Spectral Evolution of Dwarf Nova Outbursts. *John K. Cannizzo and Scott J. Kenyon*. **320**, 319, 111-E6 (1987)
- CANTÓ, J. OH Outflows in Star-forming Regions. *J. F. Mirabel, A. Ruiz, L. F. Rodríguez, and J. Cantó*. **318**, 729, 89-A1 (1987)
- Are the High-Velocity Molecular Flows Really Clumpy? *J. Cantó, L. F. Rodríguez, and G. Anglada*. **321**, 877, 134-B11 (1987)
- CANTÓ, JORGE. Interaction of the High-Density Gas with the Bipolar Outflow in Cepheus A. *José M. Torrelles, Paul T. P. Ho, Luis F. Rodríguez, Jorge Cantó, and James M. Moran*. **321**, 884, 134-C4 (1987)
- CARAVEO, P. A. EXOSAT and Einstein Observations of the X-Ray Pulsar 4U 1145 - 619. *S. Mereghetti, G. F. Bignami, P. A. Caraveo, and A. Goldwurm*. **312**, 755, 11-B11 (1987)
- A Deep Optical Study of the Field of 1E 0630 + 178. *G. F. Bignami, P. A. Caraveo, J. A. Paul, L. Salotti, and L. Vigroux*. **319**, 358, 97-A1 (1987)
- Diffuse Einstein X-Ray Emission from the Region of RCW 49, a Bright Southern Emission Nebula. *A. Goldwurm, P. A. Caraveo, and G. F. Bignami*. **322**, 349, 141-E12 (1987)
- CARDON, B. L. Absolute Oscillator Strengths for 108 Lines of Si I between 163 and 410 Nanometers. *Peter L. Smith, M. C. E. Huber, G. P. Tozzi, H. E. Griesinger, B. L. Cardon, and G. G. Lombardi*. **322**, 573, 144-B12 (1987)
- CARILLI, C. L. The Faraday Rotation of Cygnus A: Magnetic Fields in Cluster Gas. *J. W. Dreher, C. L. Carilli, and R. A. Perley*. **316**, 611, 58-F7 (1987)
- Discovery of Low-Redshift, Neutral Hydrogen Absorption in the Radio Spectrum of PKS 2020 - 370. *C. L. Carilli and J. H. van Gorkom*. **319**, 683, 102-D8 (1987)
- CARLBERG, R. G. The Vertical Structure of Galactic Disks. *R. G. Carlberg*. **322**, 59, 138-E9 (1987)
- CARLETON, N. P. The Continuum of Type 1 Seyfert Galaxies. I. A Single Form Modified by the Effects of Dust. *Martin Ward, Martin Elvis, G. Fabbiano, N. P. Carleton, S. P. Willner, and A. Lawrence*. **315**, 74, 40-F12 (1987)
- The Continuum of Type 1 Seyfert Galaxies. II. Separating Thermal and Nonthermal Components. *N. P. Carleton, Martin Elvis, G. Fabbiano, S. P. Willner, A. Lawrence, and Martin Ward*. **318**, 595, 87-D6 (1987)
- CARLSON, BARBARA E. The Role of Aqueous Chemistry in Determining the Composition and Cloud Structure of the Upper Troposphere of Uranus. *Barbara E. Carlson, Michael J. Prather, and William B. Rossow*. **321**, L97, 130-B3 (1987)
- Cloud Chemistry on Jupiter. *Barbara E. Carlson, Michael J. Prather, and William B. Rossow*. **322**, 559, 144-A11 (1987)
- CARLSSON, M. Stokes Profile Analysis and Vector Magnetic Fields. III. Extended Temperature Minima of Sunspot Umbrae as Inferred from Stokes Profiles of Mg I $\lambda 4571$. *B. W. Lites, A. Skumanich, D. E. Rees, G. A. Murphy, and M. Carlsson*. **318**, 930, 91-B6 (1987)
- CARLSTROM, J. E. VLBI Structure of 3C 84 at 89 GHz. *D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman*. **322**, 74, 138-F11 (1987)
- CARNEY, BRUCE W. The Baade-Wesselink Method and the Distances to RR Lyrae Stars. II. The Field Star X Arietis. *Rodney V. Jones, Bruce W. Carney, David W. Latham, and Robert L. Kurucz*. **312**, 254, 3-F5 (1987)
- The Baade-Wesselink Method and the Distances to RR Lyrae Stars. III. The Field Star SW Draconis. *Rodney V. Jones, Bruce W. Carney, David W. Latham, and Robert L. Kurucz*. **314**, 605, 36-B10 (1987)
- CAROUBALOS, C. Radio Evidence for a Magnetic Mirror Effect on Beams of Subrelativistic Electrons in the Solar Corona. *C. Caroubalos, M. Poquérusse, J.-L. Bourgeret, and R. Crêpel*. **319**, 503, 98-F7 (1987)
- CARR, B. J. Dark Clusters in Galactic Halos? *B. J. Carr and C. G. Lacey*. **316**, 23, 50-C6 (1987)
- CARR, JOHN S. The 2 Micron Spectrum of L1551 IRS 5. *John S. Carr, P. M. Harvey, and D. F. Lester*. **321**, L71, 129-G7 (1987)
- A Study of Clumping in the Cepheus OB 3 Molecular Cloud. *John S. Carr*. **323**, 170, 155-A1 (1987)
- CARRASCO, L. X-Ray Sources in Regions of Star Formation. II. The Pre-Main-Sequence G Star HDE 283572. *F. M. Walter, A. Brown, J. Linsky, A. E. Rydgren, F. Vrba, M. Roth, L. Carrasco, P. F. Chugainov, N. I. Shakhovskaya, and C. L. Imhoff*. **314**, 297, 31-D2 (1987)
- CARRIGAN, B. J. Positron Annihilation at the Galactic Center. *B. J. Carrigan and J. I. Katz*. **323**, 557, 160-G23 (1987)
- CARSWELL, R. F. High-Redshift QSO Absorbing Clouds and the Background Ionizing Source. *R. F. Carswell, J. K. Webb, J. A. Baldwin, and B. Atwood*. **319**, 709, 102-F13 (1987)
- CARTER, D. Weak Disks in Rapidly Rotating Elliptical Galaxies. *D. Carter*. **312**, 514, 8-E2 (1987)
- NGC 5266: An Elliptical Galaxy with a Dust Ring. *S. R. Varnas, F. Bertola, G. Galletta, K. C. Freeman, and D. Carter*. **313**, 69, 15-F12 (1987)
- CASERTANO, STEFANO. An Analysis of the Yale Bright Star Catalog. *John N. Bahcall, Stefano Casertano, and Kavan U. Ranaunga*. **320**, 515, 115-B10 (1987)
- CASPER, D. see SVOBODA, R. et al.
- CASSATELLA, A. First Unambiguous X-Ray Detection of R Aquarii. *R. Viotti, L. Piro, M. Friedjung, and A. Cassatella*. **319**, L7, 100-A10 (1987)
- Ultraviolet Observations by the IUE of 31 Clusters of the Large Magellanic Cloud. *A. Cassatella, J. Barbero, and E. H. Geyer*. **64**, 83, 18-A7 (1987) (Abstr. in **314**, 832, 38-F8)
- CASSÉ, M. Light Curves of Exploding Wolf-Rayet Stars. *R. Schaeffer, M. Cassé, and S. Cahen*. **316**, L31, 56-C8 (1987)
- CASSIDAY, G. L. Sporadic and Periodic 10-1000 TeV Gamma Rays From Cygnus X-3. *R. M. Baltrusaitis, G. L. Cassiday, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebing, C. P. Lingle, E. C. Loh, P. Sokolsky, P. Sommers, and D. Steck*. **323**, 685, 162-C1 (1987)
- CASSINELLI, J. P. Polarization of Light Scattered from the Winds of Early-Type Stars. *J. P. Cassinelli, K. H. Nordsieck, and M. A. Murison*. **317**, 290, 67-B1 (1987)
- CASSINELLI, JOSEPH P. Conditions for the Formation of Massive Stars. *Mark G. Wolfire and Joseph P. Cassinelli*. **319**, 850, 104-C7 (1987)
- CASTAÑEDA, HÉCTOR O. Fine-Scale Motion in the Central Orion Nebula. *Héctor O. Castañeda and C. R. O'Dell*. **315**, L55, 45-E9 (1987)
- Fine-Scale Motion in NGC 6514 and NGC 6523. *C. R. O'Dell, L. K. Townsley, and Hector O. Castañeda*. **317**, 676, 73-D10 (1987)
- Evidence for Turbulence in H II Regions. *C. R. O'Dell and Hector O. Castañeda*. **317**, 686, 73-E6 (1987)
- CASTELAZ, M. W. Airborne Spectrophotometry of Eta Carinae from 4.5 to 7.5 Microns and a Model for Source Morphology. *Ray W. Russell, David K. Lynch, John A. Hackwell, Richard J. Rudy, George S. Rossano, and M. W. Castelaz*. **321**, 937, 134-G1 (1987)

- CASTELAZ, MICHAEL W. *IRAS* Surface Brightness Maps of Reflection Nebulae in the Pleiades. Michael W. Castelaz, K. Sellgren, and M. W. Werner. **313**, 853, 26-B1 (1987)
- The Discovery of an Infrared Reflection Nebula Surrounding R Coronae Australis IRS 5. Michael W. Castelaz and John A. Hackwell. **314**, 317, 31-E9 (1987)
- CASWELL, J. L. Widespread Strong Methanol Masers near H II Regions. R. P. Norris, J. L. Caswell, F. F. Gardner, and K. J. Wellington. **321**, L159, 137-E8 (1987)
- CERNICARO, J. Laboratory Microwave Spectroscopy of the Vibrational Satellites for the ν_7 and $2\nu_7$ States of C_4H and Their Astronomical Identification. Satoshi Yamamoto, Shuji Saito, M. Guélin, J. Cernicharo, Hiroko Suzuki, and Masatoshi Ohishi. **323**, L149, 164-E8 (1987)
- CEROSIMO, J. C. Comet Halley: OH Absorption of Galactic Background Radio Sources. E. Bajaja, E. M. Arnal, J. C. Cerosimo, F. R. Colomb, M. C. Martin, J. Mazzaro, R. Morras, J. C. Olalde, W. G. L. Pöppel, A. M. Silva, I. F. Mirabel, and V. Boriakoff. **313**, 906, 26-F2 (1987)
- CERRUTI-SOLA, M. The "SEI" Method for Accurate and Efficient Calculations of Line Profiles in Spherically Symmetric Stellar Winds. H. J. G. L. M. Lamers, M. Cerruti-Sola, and M. Perinotto. **314**, 726, 37-E6 (1987)
- CEROSIMO, J. E. Observation of the OH 1667 MHz Line toward Comet Halley from the Southern Hemisphere. E. Bajaja, R. Morras, W. G. L. Pöppel, J. E. Cerosimo, M. C. Martin, J. Mazzaro, J. C. Olalde, A. Silva, E. M. Arnal, F. R. Colomb, I. F. Mirabel, and V. Boriakoff. **322**, 549, 144-A1 (1987)
- CHACKERIAN, C., JR. Vibration-Rotational Intensities for the $X^1\Sigma^+$ State of Al H and Al D. R. H. Tipping, A. Lopez Piñeiro, and C. Chackerian, Jr. **323**, 810, 163-E12 (1987)
- CHAFFEE, FREDERICK H., JR. Molecules at Early Epochs. II. H_2 and CO toward PHL 957. John H. Black, Frederic H. Chaffee, Jr., and Craig B. Foltz. **317**, 442, 68-G2 (1987)
- CHAKRABARTI, SANDIP K. Nucleosynthesis inside Thick Accretion Disks around a Black Hole. I. Thermodynamic Conditions and Preliminary Analysis. Sandip K. Chakrabarti, Liping Jin, and W. David Arnett. **313**, 674, 24-B10 (1987)
- CHAN, K. W. Calculated Gamma-Ray Line Fluxes from the Type II Supernova 1987A. K. W. Chan and R. E. Lingenfelter. **318**, L51, 92-B12 (1987)
- CHANCE, DON. Molecules in Galaxies. V. CO Observations of Flocculent and Grand-Design Spirals. Antony A. Stark, Bruce G. Elmegreen, and Don Chance. **322**, 64, 138-F1 (1987)
- CHANG, C. A. The Effect of a Quasi-stellar Object on Its Host Galaxy: Dynamical and Physical Processes in the Interstellar Medium around a Quasi-stellar Object. C. A. Chang, A. V. R. Schiano, and A. M. Wolfe. **322**, 180, 139-G8 (1987)
- CHANMUGAM, G. Lower Bounds on the Masses of Rapidly Rotating White Dwarfs. G. Channugam, Meenakshi Rao, and Joel E. Tohline. **319**, 188, 95-A13 (1987)
- Polarized Radiation from Extended Magnetic Polar Caps. G. Channugam and J. Frank. **320**, 746, 118-A1 (1987)
- Ohmic Decay of Crustal Neutron Star Magnetic Fields. Yeming Sang and G. Channugam. **323**, L61, 158-E2 (1987)
- CHARLES, PHILIP. A New Soft X-Ray Mode in the AM Herculis Object E2003 + 225. Julian P. Osborne, Klaus Beuermann, Philip Charles, Laura Maraschi, Koji Mukai, and Aldo Treves. **315**, L123, 49-E5 (1987)
- CHARLTON, JANE C. Kinematic Tests of Exotic Flat Cosmological Models. Jane C. Charlton and Michael S. Turner. **313**, 495, 22-C1 (1987)
- CHAYER, P. The M31 Globular Cluster System: Erratum. D. Crampton, A. P. Cowley, D. Schade, and P. Chayer. **322**, 1074, 151-F12 (1987) (Orig. paper in **288**, 494, 8-B2)
- CHEN, W.-P. Milliarsecond Resolution Infrared Observations of Young Stars in Taurus and Ophiuchus. M. Simon, R. R. Howell, A. J. Longmore, B. A. Wilking, D. M. Peterson, and W.-P. Chen. **320**, 344, 111-G3 (1987)
- CHENG, CHUNG-CHIEH. Analysis of Ultraviolet and X-Ray Observations of Three Homologous Solar Flares from SMM. Chung-Chieh Cheng and Roberto Pallavicini. **318**, 459, 84-A3 (1987)
- CHENG, F. H. New Considerations on the Broad-Line Regions of Quasars. J. H. You and F. H. Cheng. **322**, 174, 139-G2 (1987)
- CHENG, K. S. Outer Magnetospheric Fluctuations and Pulsar Timing Noise. K. S. Cheng. **321**, 799, 133-C9 (1987)
- Could Glitches Inducing Magnetospheric Fluctuations Produce Low-Frequency Pulsar Timing Noise? K. S. Cheng. **321**, 805, 133-C13 (1987)
- CHERNOFF, DAVID F. Magnetohydrodynamic Shocks in Molecular Clouds. David F. Chernoff. **312**, 143, 2-E6 (1987)
- Globular Cluster Evolution in the Galaxy: A Global View. David F. Chernoff and Stuart L. Shapiro. **322**, 113, 139-B9 (1987)
- CHESTER, T. A Model for the Emission from the Bulge of Our Galaxy. M. Rowan-Robinson and T. Chester. **313**, 413, 19-E4 (1987)
- CHESTER, THOMAS J. Observation of the HH 1 and 2 Region with *IRAS*. Steven H. Pravo and Thomas J. Chester. **314**, 308, 31-D13 (1987)
- CHEUNG, K. W. Molecular Gas in the Starburst Nucleus of M82. K. Y. Lo, K. W. Cheung, C. R. Masson, T. G. Phillips, S. L. Scott, and D. P. Woody. **312**, 574, 9-B7 (1987)
- CHEVALIER, R. A. Late Emission from SN 1987A. C. Fransson and R. A. Chevalier. **322**, L15, 145-B2 (1987)
- CHEVALIER, ROGER A. High-Velocity Emission in Young Supernova Remnants: SN 1006 and SN 1572. Robert P. Kirshner, P. Frank Winkler, and Roger A. Chevalier. **315**, L135, 49-F3 (1987)
- The Evolution of Cooling Flows. I. Self-similar Cluster Flows. Roger A. Chevalier. **318**, 66, 79-E14 (1987)
- Shocked Relativistic Magnetohydrodynamic Flows with Application to Pulsar Winds. Robert T. Emmering and Roger A. Chevalier. **321**, 334, 125-G10 (1987)
- CHITRE, S. M. The Intensity Ratio in Different Wave Bands between Images of Gravitationally Lensed Quasars as a Probe of Dark Matter. Kandaswamy Subramanian and S. M. Chitre. **313**, 13, 15-B5 (1987)
- The Gravitational Lens System 2016 + 112 Revisited. D. Narasimha, K. Subramanian, and S. M. Chitre. **315**, 434, 45-D11 (1987)
- New Limits to Bias and the Amount of Dark Matter in the Universe. William C. Saslaw, H. M. Antia, and S. M. Chitre. **315**, L1, 45-A4 (1987)
- CHIUH, TZIHONG. The Structure and Dissipation of Forced Current Sheets in the Solar Atmosphere. Tzihong Chiu and Ellen G. Zweibel. **317**, 900, 76-A7 (1987)
- CHOKSHI, ARATI. The Red/Infrared Evolution in Galaxies—Effects of the Stars on the Asymptotic Giant Branch. Arati Chokshi and Edward L. Wright. **319**, 44, 93-E1 (1987)
- CHOU, DEAN-YI. The Cooling Time Scales of Growing Sunspots. Dean-Yi Chou. **312**, 955, 13-D5 (1987)
- CHOUDHURI, ARNAB RAI. The Influence of the Coriolis Force on Flux Tubes Rising through the Solar Convection Zone. Arnab Rai Choudhuri and Peter A. Gilman. **316**, 788, 60-F7 (1987)
- CHRISTIAN, C. A. Detection of the Lensing Galaxy in PG 1115 + 080. C. A. Christian, D. Crabtree, and P. Waddell. **312**, 45, 1-D10 (1987)
- CHRISTODOULOU, DIMITRIS M. The Crucial Role of Cooling in the Making of Molecular Clouds and Stars. Joel E. Tohline, Peter H. Bodenheimer, and Dimitris M. Christodoulou. **322**, 787, 148-D9 (1987)
- CHRYSICOPOULOU, P. see SYOBODA, R. et al.
- CHU, YOU-HUA. The Wolf-Rayet Population in 30 Doradus and Its Surroundings. Anthony F. J. Moffat, Virpi S. Niemela, M. M. Phillips, You-hua Chu, and Wilhelm Seggewiss. **312**, 612, 9-E7 (1987)
- CHU, YOU-HUA. The Composite Image of Sanduleak -69° 202, Candidate Precursor to Supernova 1978A in the Large Magellanic Cloud. Nolan R. Walborn, Barry M. Lasker, Victoria G. Laidler, and You-Hua Chu. **321**, L41, 129-E4 (1987)
- Multiple-Shell Planetary Nebulae. I. Morphologies and Frequency of Occurrence. You-Hua Chu, George H. Jacoby, and Richard Arendt. **64**, 529, 24-C1 (1987) (Abstr. in **317**, 1002, 77-B5)
- CHUGANOV, P. F. X-Ray Sources in Regions of Star Formation. II. The Pre-Main-Sequence G Star HDE 283572. F. M. Walter, A. Brown, J. L. Linsky, A. E. Rydgren, F. Vrba, M. Roth, L. Carrasco, P. F. Chugainov, N. I. Shakovskaya, and C. L. Imhoff. **314**, 297, 31-D2 (1987)
- CHUPP, E. L. Solar Neutron Emissivity During the Large Flare on 1982 June 3. E. L. Chupp, H. Debrunner, E. Flückiger, D. J. Forrest, F. Golitz, G. Kanbach, W. T. Vestrand, J. Cooper, and G. Share. **318**, 913, 91-A1 (1987)
- Gamma-Ray Observations of the Crab Region Using a Coded-Aperture Telescope. M. L. McConnell, P. P. Dunphy, D. J. Forrest, E. L. Chupp, and A. Owens. **321**, 543, 128-A13 (1987)
- The Directivity of High-Energy Emission from Solar Flares. II. Solar Maximum Mission Observations. W. Thomas Vestrand, D. J. Forrest, E. L. Chupp, E. Rieger, and G. H. Share. **322**, 1010, 151-A7 (1987)
- CHURCHWELL, E. Low-Mass, Pre-Main-Sequence Stars: The Infrared Emission from Circumstellar Dust. M. G. Wolfire and E. Churchwell. **315**, 315, 43-C14 (1987)
- Solar System-Sized Condensations in the Orion Nebula. E. Churchwell, M. Felli, D. O. S. Wood, and M. Massi. **321**, 516, 127-F11 (1987)
- The Discovery of Nonthermal Radio Emission from Magnetic Bp-Ap Stars. Stephen A. Drake, David C. Abbott, T. S. Bastian, J. H. Bieging, E. Churchwell, G. Dulk, and Jeffrey L. Linsky. **322**, 902, 149-F10 (1987)
- CIARDULLO, ROBIN. The Spatial Distribution and Population of Novae in M31. Robin Ciardullo, Holland C. Ford, James D. Neill, George H. Jacoby, and Allen W. Shafter. **318**, 520, 86-E6 (1987)
- The Morphology of the Rich Supercluster 1451 + 22. Robin Ciardullo. **321**, 607, 131-C1 (1987)

- CIOCIO, A. *see* SVOBODA, R. *et al.*
- CLARK, T. A. Solar Brightness Temperature at Submillimeter Wavelengths. R. T. Boreiko and T. A. Clark. **318**, 445, 83-G2 (1987)
- CLAUS, R. *see* SVOBODA, R. *et al.*
- CLAUSSEN, M. J. Water Masers Associated with Low-Mass Stars: A Survey of the Rho Ophiuchi Infrared Cluster. B. A. Wilking and M. J. Claussen. **320**, L133, 121-E4 (1987)
- A Flux-limited Sample of Galactic Carbon Stars. M. J. Claussen, S. G. Kleinmann, R. R. Joyce, and M. Jura. **65**, 385, 33-F1 (1987) (Abstr. in **321**, 1050, 136-A1)
- CLAVEL, J. The Fading of the Narrow-Line Region in 3C 390.3. J. Clavel and W. Wamsteker. **320**, L9, 114-A12 (1987)
- A Detailed Study of the C IV $\lambda 1550$ Line Profile and Adjacent Spectral Features in NGC 4151 from 1978 to 1983. J. Clavel, A. Altamore, A. Boksenberg, G. E. Bromage, A. Elius, D. Pelat, M. V. Penston, G. C. Perola, M. A. J. Snijders, and M. H. Ulrich. **321**, 251, 125-A5 (1987)
- CLAYTON, DONALD D. Galactic Chemical Evolution: z versus $\lambda n(1/\mu)$ Relationship. Donald D. Clayton. **315**, 451, 45-F1 (1987)
- Positron Annihilation Gamma Rays from Novae. Mark D. Leising and Donald D. Clayton. **323**, 159, 154-G4 (1987)
- CLEGG, R. E. S. The Planetary Nebula NGC 3918. R. E. S. Clegg, J. P. Harrington, M. J. Barlow, and J. R. Walsh. **314**, 551, 35-E7 (1987)
- CLEMENS, D. P. Where Massive Stars Form: Associated Radio H II Regions and CO Clouds in the Northern Milky Way. W. H. Waller, D. P. Clemens, D. B. Sanders, and N. Z. Scoville. **314**, 397, 32-E4 (1987)
- High-Excitation SiO Masers in Evolved Stars. P. R. Jewell, Dale F. Dickinson, L. E. Snyder, and D. P. Clemens. **323**, 749, 163-A1 (1987)
- Molecular Clouds and Cloud Cores in the Inner Galaxy. N. Z. Scoville, Min Su Yun, D. P. Clemens, D. B. Sanders, and W. H. Waller. **63**, 821, 13-G12 (1987) (Abstr. in **314**, 832, 38-F8)
- CLINE, T. Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Kouveliotou, T. Cline, B. Dennis, U. Desai, and L. Orwig. **320**, L105, 121-C7 (1987)
- CLINE, T. L. Gamma-Ray Burster Counterparts: Infrared. Bradley E. Schaefer, T. L. Cline, U. Desai, B. J. Teegarden, J.-L. Atteia, C. Barat, K. Hurley, M. Niel, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, I. V. Estulin, and A. V. Kuznetsov. **313**, 226, 17-D9 (1987)
- A New Type of Repetitive Behavior in a High-Energy Transient. J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Kouveliotou, T. L. Cline, B. R. Dennis, U. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov. **320**, L111, 121-C13 (1987)
- SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806 - 20. C. Kouveliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Neil, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov. **322**, L21, 145-B8 (1987)
- CLOUTMAN, LAWRENCE D. A New Estimate of the Mixing Length and Convective Overshooting in Massive Stars. Lawrence D. Cloutman. **313**, 699, 24-D8 (1987)
- COBB, MICHAEL L. Infrared Spectroscopy of IRC +10420. John D. Fix and Michael L. Cobb. **312**, 290, 4-B1 (1987)
- Infrared Speckle Interferometry and Imaging of Several OH/IR Stars. Michael L. Cobb and John D. Fix. **315**, 325, 43-D10 (1987)
- COCHRAN, A. L. Supernovae 1983i and 1983v: Evidence for Abundance Variations in Type Ib Supernovae. J. C. Wheeler, R. P. Harkness, E. S. Barker, A. L. Cochran, and D. Wills. **313**, L69, 27-C11 (1987)
- The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Leveault. **317**, 355, 67-F14 (1987)
- CODONA, J. L. Refractive Scintillation in the Interstellar Medium. W. A. Coles, R. G. Frehlich, B. J. Rickett, and J. L. Codona. **315**, 666, 48-A1 (1987)
- COHEN, J. G. The Distance to M5 from Its RR Lyrae Variables. J. G. Cohen and G. A. Gordon. **318**, 215, 81-C4 (1987)
- COHEN, JEFFREY M. Gamma-Ray Pulsar Model. Jeffrey M. Cohen and Errol Mustajafa. **319**, 930, 105-B5 (1987)
- COHEN, M. H. Evolution of 3C 273 at 10.7 GHz. M. H. Cohen, J. A. Zensus, J. A. Biretta, G. Comoretto, P. Kaufmann, and Z. Abraham. **315**, L89, 49-B11 (1987)
- COHEN, MARTIN. IRAS Observations of the Exciting Stars of Herbig-Haro Objects. Martin Cohen and Richard D. Schwartz. **316**, 311, 53-D3 (1987)
- Observations of Jets from Low-Luminosity Stars. II. SVS 12, HH 30, Near HL Tauri, and HH 34. Martin Cohen and B. F. Jones. **321**, 846, 133-F13 (1987)
- Optical Spectroscopy of IRAS Sources with Infrared Emission Bands: IRAS 21282 + 5050 and the Diffuse Interstellar Bands. Martin Cohen and B. F. Jones. **321**, L151, 137-E1 (1987)
- Near-Infrared H₂ Emission from Herbig-Haro Objects. I. A Survey of Low-Excitation Objects. Richard D. Schwartz, Martin Cohen, and Peredur M. Williams. **322**, 403, 142-C2 (1987)
- COHEN, N. L. VLBI Observations of 23 Hot Spots in the Starburst Galaxy M82. N. Bartel, M. I. Ratner, A. E. E. Rogers, I. I. Shapiro, R. J. Bonometti, N. L. Cohen, M. V. Gorenstein, J. M. Marcaide, and R. A. Preston. **323**, 505, 160-B3 (1987)
- COHEN, R. C. Laboratory Measurement of the Pure Rotational Spectrum of Vibrationally Excited HCO⁺ ($v=1$) by Far-Infrared Laser Sideband Spectroscopy. Geoffrey A. Blake, K. B. Laughlin, R. C. Cohen, Kerry L. Busarow, and R. J. Saykally. **316**, L45, 56-D7 (1987)
- COHEN, R. S. A Large Molecular Cloud in Lupus Far From the Galactic Plane. L.-A. Nymann, P. Thaddeus, L. Bronfman, and R. S. Cohen. **314**, 374, 32-C4 (1987)
- Molecular Clouds in the Carina Arm: Large-Scale Properties of Molecular Gas and Comparison with H I. D. A. Grabelsky, R. S. Cohen, L. Bronfman, P. Thaddeus, and J. May. **315**, 122, 41-D2 (1987)
- A Composite CO Survey of the Entire Milky Way. T. M. Dame, H. Ungerechts, R. S. Cohen, E. J. de Geus, I. A. Grenier, J. May, D. C. Murphy, L.-A. Nymann, and P. Thaddeus. **322**, 706, 147-D13 (1987)
- COHEN, ROSS D. The Nature of the BL Lacertae Object AO 0235 + 164. Ross D. Cohen, Harding E. Smith, Vesa T. Junkkarinen, and E. Margaret Burbidge. **318**, 577, 87-C1 (1987)
- The Pleiades Rapid Rotators: Evidence for an Evolutionary Sequence. R. Paul Butler, Ross D. Cohen, Douglas K. Duncan, and Geoffrey W. Marcy. **319**, L19, 100-B9 (1987)
- Emission-Line Variability and the Broad-Line Region of Quasi-stellar Objects. I. Time Scales and Photon Densities. Wei Zheng, E. Margaret Burbidge, Harding E. Smith, Ross D. Cohen, and Steven E. Bradley. **322**, 164, 139-F5 (1987)
- COHN, HALDAN. CCD Photometry of Globular Cluster Core Structure. I. NGC 6388, NGC 6624, and M15—One Flat Core and Two Cusps. Phyllis M. Lugger, Haldan Cohn, Jonathan E. Grindlay, Charles D. Bailyn, and Paul Hertz. **320**, 482, 114-F8 (1987)
- COHN, HALDAN N. The Evolution of Active Galactic Nuclei. I. Models without Stellar Evolution. Laurence P. David, Richard H. Durisen, and Haldan N. Cohn. **313**, 556, 22-G9 (1987)
- The Evolution of Active Galactic Nuclei. II. Models with Stellar Evolution. Laurence P. David, Richard H. Durisen, and Haldan N. Cohn. **316**, 505, 57-E4 (1987)
- Evolution of N-Body Systems with Tidally Captured Binaries through the Core Collapse Phase. Thomas S. Statler, Jeremiah P. Ostriker, and Haldan N. Cohn. **316**, 626, 58-G9 (1987)
- COLANGELI, L. Amorphous Carbon and the Unidentified Infrared Bands. A. Borghesi, E. Bussolletti, and L. Colangeli. **314**, 422, 32-G2 (1987)
- Interstellar Amorphous Carbon. E. Bussolletti, L. Colangeli, and V. Orofino. **321**, L87, 130-A7 (1987)
- COLES, W. A. Refractive Scintillation in the Interstellar Medium. W. A. Coles, R. G. Frehlich, B. J. Rickett, and J. L. Codona. **315**, 666, 48-A1 (1987)
- COLEY, A. A. Observations and Nonstandard FRW Models. A. A. Coley. **318**, 487, 86-C1 (1987)
- COLLURA, A. Variability Analysis in Low Count Rate Sources. A. Collura, A. Maggio, S. Sciortino, S. Serio, G. S. Vaiana, and R. Rosner. **315**, 340, 43-E11 (1987)
- COLOMB, F. R. Comet Halley: OH Absorption of Galactic Background Radio Sources. E. Bajaja, E. M. Arnal, J. C. Cerasimo, F. R. Colomb, M. C. Martin, J. Mazzaro, R. Morras, J. C. Olalde, W. G. L. Poppel, A. M. Silva, I. F. Mirabel, and V. Boriakoff. **313**, 906, 26-F2 (1987)
- Observation of the OH 1667 MHz Line toward Comet Halley from the Southern Hemisphere. E. Bajaja, R. Morras, W. G. L. Poppel, J. E. Cerasimo, M. C. Martin, J. Mazzaro, J. C. Olalde, A. Silva, E. M. Arnal, F. R. Colomb, I. F. Mirabel, and V. Boriakoff. **322**, 549, 144-A1 (1987)
- COMBES, F. The Interstellar Clouds toward 3C 154 and 3C 353. S. R. Federman, Neal J. Evans II, R. F. Willson, E. Falgarone, F. Combes, and B. M. Scheufele. **322**, 960, 150-D4 (1987)
- COMINSKY, LYNN R. Time-dependent Calculations of X-Ray and γ Reprocessing. Lynn R. Cominsky, Richard A. London, and Richard I. Klein. **315**, 162, 41-F14 (1987)
- COMORETTO, G. Evolution of 3C 273 at 10.7 GHz. M. H. Cohen, J. A. Zensus, J. A. Biretta, G. Comoretto, P. Kaufmann, and Z. Abraham. **315**, L89, 49-B11 (1987)
- CONDON, J. J. The Relationship between Stellar Population and Radio Continuum Emission in Spiral Galaxies. David Burstein, J. J. Condon, and Q. F. Yin. **315**, L99, 49-C8 (1987)

- A Very Deep *IRAS* Survey: Constraints on the Evolution of Starburst Galaxies. *Perry Hacking, J. J. Condon, and J. R. Houck*. **316**, L15, 56-B4 (1987)
- Near-Infrared Observations of Submillijansky Radio Sources: Evidence for a Population of Starburst Galaxies at Intermediate Redshifts. *Trinh X. Thuan and J. J. Condon*. **322**, L9, 145-A11 (1987)
- A 1.49 GHz Atlas of Spiral Galaxies with $B_T \leq +12$ and $\delta \geq -45^\circ$. *J. J. Condon*. **65**, 485, 36-B1 (1987) (Abstr. in **322**, 1075, 151-G1)
- A 1.49 GHz Supplementary Atlas of Spiral Galaxies with *H*-Magnitudes. *J. J. Condon, Q. F. Yin, and David Burstein*. **65**, 543, 36-G1 (1987) (Abstr. in **322**, 1075, 151-G1)
- CONNALLY, MICHAEL J. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of *Voyager 2*. *John D. Anderson, Timothy P. Krisher, Susan E. Borutski, Michael J. Connally, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen*. **323**, L141, 164-E1 (1987)
- CONNORS, DENNIS. The Dust Shells of NML Cygnus and IRC 10420: Inner Radius, Temperature, and Optical Thickness: Erratum. *Stephen T. Ridgway, Richard R. Joyce, Dennis Connors, Judith L. Pipher, and Christopher Dainty*. **312**, 963, 13-E1 (1987) (Orig. paper in **302**, 662, 37-G8)
- COOK, J. W. SKYLAB XUV Observations of Densities, Thermal Structure, and Mass Motions in a Compact Flare. *Kenneth G. Widing and J. W. Cook*. **320**, 913, 119-F14 (1987)
- COOPER, J. Solar Neutron Emissivity During the Large Flare on 1982 June 3. *E. L. Chupp, H. Debrunner, E. Flückiger, D. J. Forrest, F. Golliez, G. Kanbach, W. T. Vestrand, J. Cooper, and G. Share*. **318**, 913, 91-A1 (1987)
- COOPER, R. Sporadic and Periodic 10–1000 TeV Gamma Rays From Cygnus X-3. *R. M. Baltrusaitis, G. L. Cassiday, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebing, C. P. Lingle, E. C. Loh, P. Sokolsky, P. Sommers, and D. Steck*. **323**, 685, 162-C1 (1987)
- COOPERSTEIN, J. Neutrino Flows in Collapsing Stars: A Two-Fluid Model: Erratum. *J. Cooperstein, L. J. van den Horn, and E. A. Baron*. **315**, 729, 48-E10 (1987) (Orig. paper in **309**, 653, 128-D5)
- Collapse of $9 M_\odot$ Stars. *E. Baron, J. Cooperstein, and S. Kahana*. **320**, 300, 111-D1 (1987)
- Collapsing White Dwarfs. *E. Baron, J. Cooperstein, S. Kahana, and K. Nomoto*. **320**, 304, 111-D5 (1987)
- Neutrino Pair Energy Deposition in Supernovae. *J. Cooperstein, L. J. van den Horn, and E. Baron*. **321**, L129, 137-C7 (1987)
- Convection in Supernova Theory. *H. A. Bethe, G. E. Brown, and J. Cooperstein*. **322**, 201, 140-B3 (1987)
- CORBALLY, CHRISTOPHER J. An Atlas of 12 Rather Subtle Composite Spectra. *Christopher J. Corbally*. **63**, 365, 6-A2 (1987) (Abstr. in **312**, 966, 13-E7)
- CORDES, J. M. Interstellar Interferometry of the Pulsar PSR 1237 + 25. *A. Wolzecz and J. M. Cordes*. **320**, L35, 114-C11 (1987)
- Monte Carlo Simulations of Radio Pulsars and Their Progenitors. *R. J. Dewey and J. M. Cordes*. **321**, 780, 133-A14 (1987)
- CORDES, JAMES M. VLA and Low-Frequency VLBI Observations of the Radio Source 0503 + 467: Austere Constraints on Interstellar Scattering in Two Media. *Steven R. Spangler, Alan L. Fey, and James M. Cordes*. **322**, 909, 149-G3 (1987)
- CORNELL, M. E. Isophotal Diameters of Cluster Spirals. *M. E. Cornell, M. Aaronson, G. Bothun, and J. Mould*. **64**, 507, 24-A5 (1987) (Abstr. in **317**, 1002, 77-B5)
- CORNETT, ROBERT M. Vacuum Ultraviolet Images of the Large Magellanic Cloud. *Andrew M. Smith, Robert M. Cornett, and Robert S. Hill*. **320**, 609, 116-C9 (1987)
- CORONITI, F. V. Radiation-Hydrodynamic Calculation of Sub-Eddington Accretion Disks. *G. E. Eggum, F. V. Coroniti, and J. I. Katz*. **323**, 634, 161-F1 (1987)
- CORTEZ, B. see SVOBODA, R. et al.
- COSTA, E. Time Variability of Gamma Cassiopeiae in X-Rays. *F. Frontera, D. Dal Fiume, N. R. Robba, G. Manzo, S. Re, and E. Costa*. **320**, L127, 121-D13 (1987)
- COTA, STEPHEN A. The Double Broad-Line Emitting Regions in NGC 5548 as Possible Evidence for a Supermassive Binary. *Bradley M. Peterson, Kirk T. Korista, and Stephen A. Cota*. **312**, L1, 7-A4 (1987)
- COURVOISIER, THIERRY J.-L. The Optical Light Curve of the Low-Mass X-Ray Binary XB 1254 – 690. *Christian Motch, Holger Pedersen, Klaus Beuermann, Manfred W. Pakull, and Thierry J.-L. Courvoisier*. **313**, 792, 25-D8 (1987)
- COWAN, JOHN J. Nuclear Chronometers from the *r*-Process and the Age of the Galaxy. *John J. Cowan, F.-K. Thielemann, and J. W. Truran*. **323**, 543, 160-F1 (1987)
- COWIE, L. L. Are the Virial Masses of Clusters Smaller Than We Think? *L. L. Cowie, M. Henriksen, and R. Mushotzky*. **317**, 593, 72-E11 (1987)
- COWIE, LENNOX L. The Distribution of Gas and Galaxies around the Distant Quasar PKS 1614 + 051. *Esther M. Hu and Lennox L. Cowie*. **317**, L7, 71-A9 (1987)
- The Formation of Families of Twin Galaxies By String Loops. *Lennox L. Cowie and Esther M. Hu*. **318**, L33, 92-A9 (1987)
- COWLEY, A. P. The Space Distribution of Faint Quasars from the CFHT Survey. *David Crampton, A. P. Cowley, and F. D. A. Hartwick*. **314**, 129, 29-D4 (1987)
- Kinematics and Age of the Low-Mass X-Ray Binaries. *A. P. Cowley, J. B. Hutchings, David Crampton, and F. D. A. Hartwick*. **320**, 296, 111-C11 (1987)
- CAL 83: A Puzzling X-Ray Source in the Large Magellanic Cloud. *David Crampton, A. P. Cowley, J. B. Hutchings, Paul C. Schmidtke, I. B. Thompson, and James Liebert*. **321**, 745, 132-F3 (1987)
- The M31 Globular Cluster System: Erratum. *D. Crampton, A. P. Cowley, D. Schade, and P. Chayer*. **322**, 1074, 151-F12 (1987) (Orig. paper in **288**, 494, 8-B2)
- COWLEY, CHARLES R. Identification of Lines in the Satellite Ultraviolet: The Spectrum of Tau Scorpii. *Charles R. Cowley and Donald R. Merritt*. **321**, 553, 128-B10 (1987)
- COWSIK, R. Dark Matter in the Universe: Massive Neutrinos Revisited. *R. Cowsik and P. Ghosh*. **317**, 26, 64-C4 (1987)
- COX, ARTHUR N. Pulsations of White Dwarf Stars with Thick Hydrogen or Helium Surface Layers. *Arthur N. Cox, Sumner G. Starrfield, Russell B. Kidman, and W. Dean Pesnell*. **317**, 303, 67-B14 (1987)
- CRABTREE, D. Detection of the Lensing Galaxy in PG 1115 + 080. *C. A. Christian, D. Crabtree, and P. Waddell*. **312**, 45, 1-D10 (1987)
- CRABTREE, DENNIS. The Late-Type Stellar Content of NGC 55. *Christopher J. Pritchett, Harvey B. Richer, David Schade, Dennis Crabtree, and H. K. C. Yee*. **323**, 79, 154-A3 (1987)
- CRAIG, I. J. D. Fast Downflows in the Solar Transition Region Explained. *A. N. McClymont and I. J. D. Craig*. **312**, 402, 5-C2 (1987)
- Why Coronal Loops Cannot Exist without Solar Gravity. *I. J. D. Craig and A. N. McClymont*. **318**, 421, 83-E5 (1987)
- CRAM, L. E. Formation of Chromospheric Lines in Cool Dwarf Stars. *L. E. Cram and M. S. Giampapa*. **323**, 316, 156-D13 (1987)
- CRAMPTON, D. The M31 Globular Cluster System: Erratum. *D. Crampton, A. P. Cowley, D. Schade, and P. Chayer*. **322**, 1074, 151-F12 (1987) (Orig. paper in **288**, 494, 8-B2)
- CRAMPTON, DAVID. The Space Distribution of Faint Quasars from the CFHT Survey. *David Crampton, A. P. Cowley, and F. D. A. Hartwick*. **314**, 129, 29-D4 (1987)
- Kinematics and Age of the Low-Mass X-Ray Binaries. *A. P. Cowley, J. B. Hutchings, David Crampton, and F. D. A. Hartwick*. **320**, 296, 111-C11 (1987)
- CAL 83: A Puzzling X-Ray Source in the Large Magellanic Cloud. *David Crampton, A. P. Cowley, J. B. Hutchings, Paul C. Schmidtke, I. B. Thompson, and James Liebert*. **321**, 745, 132-F3 (1987)
- CRANNELL, C. J. The High-Energy X-Ray Spectrum of Black Hole Candidate GX 339 – 4 during a Transition. *J. F. Dolan, C. J. Crannell, B. R. Dennis, and L. E. Orwig*. **322**, 324, 141-D1 (1987)
- CRENSHAW, D. MICHAEL. Ultraviolet Observations of SN 1987A. *Robert P. Kirshner, George Sonneborn, D. Michael Crenshaw, and George E. Nassiopoulos*. **320**, 602, 116-C2 (1987)
- CRÉPEL, R. Radio Evidence for a Magnetic Mirror Effect on Beams of Subrelativistic Electrons in the Solar Corona. *C. Caroubalos, M. Poquéusse, J.-L. Bourgeret, and R. Crépél*. **319**, 503, 98-F7 (1987)
- CRIBB, P. H. Excitation and Dissociation of Molecular Hydrogen in Shock Waves at Interstellar Densities. *J. E. Dove, A. C. M. Rusk, P. H. Cribb, and P. G. Martin*. **318**, 379, 83-A11 (1987)
- CRINKLAW, GREG. Spectroscopy of the Optical Photosphere of the Hot Pulsating Star BW Vulpeculae. *Ingemar Furenlid, Arthur Young, Thomas Meylan, Chester Haag, and Greg Crinklaw*. **319**, 264, 95-G9 (1987)
- CROMWELL, RICHARD H. Chromospheric Activity and Ages of Solar-Type Stars. *Don C. Barry, Richard H. Cromwell, and E. Keith Hege*. **315**, 264, 42-G5 (1987)
- CRONIN, N. Observations of Globules and Dark Clouds in the CO $J = 3-2$ and $J = 2-1$ Lines. *L. W. Avery, Glenn J. White, I. P. Williams, and N. Cronin*. **312**, 848, 12-B13 (1987)
- CROSWELL, KEN. Mass Loss from FU Orionis Objects. *Ken Crosswell, L. Hartmann, and E. H. Avrett*. **312**, 227, 3-D6 (1987)
- CRUDDACE, R. G. Spartan 1 X-Ray Observations of the Perseus Cluster: Comparison of the Iron Abundances and Temperatures in the Inner and Outer Regions of the Cluster. *M. P. Ulmer, R. G. Cruddace, E. E. Fenimore, G. G. Fritz, and W. A. Snyder*. **319**, 118, 94-C11 (1987)
- CRUTCHER, R. M. The CO $J = 2 \rightarrow 1$ Emission from the Interstellar Gas toward Zeta Ophiuchi. *R. M. Crutcher and S. R. Federman*. **316**, L71,

- 62-C2 (1987)
- CUPERMAN, S. Theoretical Non-Maxwellian Particle Velocity Distribution Functions for Spherically Symmetric Solar Wind-like Plasma Systems and Consequences. II. The Case of Large Thermal Anisotropy and Nine Moments Description for Each Species. *S. Cuperman, H. Yatom, M. Dryer, and D. Lewis*. **314**, 404, 32-E11 (1987)
- CURL, R. F. Long Carbon Chain Molecules in Circumstellar Shells. *H. W. Kroto, J. R. Heath, S. C. O'Brien, R. F. Curl, and R. E. Smalley*. **314**, 352, 32-A9 (1987)
- CUTLER, CURT. The Effect of Viscosity on Neutron Star Oscillations. *Curt Cutler and Lee Lindblom*. **314**, 234, 30-F4 (1987)
- CUTRI, ROC. BE Ursae Majoris: A Detached Binary with a Unique Reprocessing Spectrum. *Donald H. Ferguson, James Liebert, Roc Cutri, Richard F. Green, S. P. Willner, João E. Steiner, and Susan Tokarz*. **316**, 399, 54-D4 (1987)
- CZERNY, B. Persistent Emission and Bursts from Aquila X-1 Observed by Einstein. *M. Czerny, B. Czerny, and J. E. Grindlay*. **312**, 122, 2-C13 (1987)
- CZERNY, BOZENA. X-Ray Spectra of PG Quasars. II. The X-Ray-Ultraviolet Excess of PG 1211 + 143. *Jill Bechtold, Bozena Czerny, Martin Elvis, G. Fabbiano, and Richard F. Green*. **314**, 699, 37-C5 (1987)
- Constraints on Quasar Accretion Disks from the Optical/Ultraviolet/Soft X-Ray Big Bump. *Bozena Czerny and Martin Elvis*. **321**, 305, 125-E5 (1987)
- CZERNY, M. Persistent Emission and Bursts from Aquila X-1 Observed by Einstein. *M. Czerny, B. Czerny, and J. E. Grindlay*. **312**, 122, 2-C13 (1987)
- DA COSTA, G. S. Intermediate-Age Core Helium Burning Stars and the Distance to the Magellanic Clouds. *E. Seidel, G. S. Da Costa, and Pierre Demarque*. **313**, 192, 17-B1 (1987)
- The Age of the Large Magellanic Cloud Cluster NGC 2193. *G. S. Da Costa, Christopher R. King, and J. R. Mould*. **321**, 735, 132-E6 (1987)
- DAGDEVIREN, N. R. Effect of Ion Correlations on Free-Free Opacities. *N. R. Dagdeviren and S. E. Koonin*. **319**, 192, 95-B3 (1987)
- DAHLBURG, R. B. Nonlinear Evolution of Radiation-driven Thermally Unstable Fluids. *R. B. Dahlburg, C. R. DeVore, J. M. Picone, J. T. Mariska, and J. T. Karpen*. **315**, 385, 44-B5 (1987)
- DAINTY, CHRISTOPHER. The Dust Shells of NML Cygnus and IRC 10420: Inner Radius, Temperature, and Optical Thickness: Erratum. *Stephen T. Ridgway, Richard R. Joyce, Dennis Connors, Judith L. Pipher, and Christopher Dainty*. **312**, 963, 13-E1 (1987) (Orig. paper in **302**, 662, 37-G8)
- DAL FIUME, D. Time Variability of Gamma Cassiopeiae in X-Rays. *F. Frontera, D. Dal Fiume, N. R. Robba, G. Manzo, S. Re, and E. Costa*. **320**, L127, 121-D13 (1987)
- DALGARN, A. Editorial: Publication Times and Volume Indexes. *Helmut A. Abt and A. Dalgarno*. **315**, L71, 49-A9 (1987)
- Oxygen Chemistry of Shocked Interstellar Clouds. II. Effects of Non-thermal Internal Energy on Chemical Evolution. *M. M. Graff and A. Dalgarno*. **317**, 432, 68-F6 (1987)
- Cosmic-Ray-induced Photodestruction of Interstellar Molecules in Dense Clouds. *A. Sternberg, A. Dalgarno, and S. Lepp*. **320**, 676, 117-B11 (1987)
- The Abundance of H_2^+ Ions in Dense Interstellar Clouds. *S. Lepp, A. Dalgarno, and A. Sternberg*. **321**, 383, 126-D4 (1987)
- The C/CO Ratio in Dense Interstellar Clouds. *R. Gredel, S. Lepp, and A. Dalgarno*. **323**, L137, 164-D12 (1987)
- DALY, RUTH A. The Origin of the Diffuse X-Ray Background and the Formation of Galaxies and Voids. *Ruth A. Daly*. **322**, 20, 138-B12 (1987)
- DAMÉ, L. Observation and Oscillatory Properties of Mesostructures in the Solar Chromosphere. *L. Damé and M. Maric*. **314**, L15, 33-C2 (1987)
- DAME, T. M. A Composite CO Survey of the Entire Milky Way. *T. M. Dame, H. Ungerechts, R. S. Cohen, E. J. de Geus, I. A. Grenier, J. May, D. C. Murphy, L.-A. Nyman, and P. Thaddeus*. **322**, 706, 147-D13 (1987)
- DAMEN, E. EXOSAT Observations of 4U/MXB 1636 - 53: On the Relation between the Amount of Accreted Fuel and the Strength of an X-Ray Burst. *W. H. G. Lewin, W. Penninx, J. van Paradijs, E. Damen, M. Sztajno, J. Trümper, and M. van der Klis*. **319**, 893, 104-F9 (1987)
- DANESE, L. Interpretation of Deep Counts of Radio Sources. *L. Danese, G. De Zotti, A. Franceschini, and L. Toffolatti*. **318**, L15, 85-B2 (1987)
- DANIELSON, G. E. Detection of CO(1 \rightarrow 0) Emission and Optical Imaging of the Seyfert Galaxy/QSO Markarian 231. *D. B. Sanders, J. S. Young, N. Z. Scoville, B. T. Soifer, and G. E. Danielson*. **312**, L5, 7-A8 (1987)
- The IRAS Bright Galaxy Sample. II. The Sample and Luminosity Function. *B. T. Soifer, D. B. Sanders, B. F. Madore, G. Neugebauer, G. E. Danielson, J. H. Elias, Carol J. Lonsdale, and W. L. Rice*. **320**, 238, 110-F7 (1987)
- D'ANTONA, FRANCESCA. Evolution of Very Low Mass Stars and Brown Dwarfs. II. The Population II. *Francesca D'Antona*. **320**, 653, 117-A1 (1987)
- DÄPPEN, WERNER. Hypercharge, Solar Structure, and Stellar Evolution. *Ronald L. Gilliland and Werner Däppen*. **313**, 429, 19-F7 (1987)
- Statistical Mechanics of Partially Ionized Stellar Plasmas: The Planck-Larkin Partition Function, Polarization Shifts, and Simulations of Optical Spectra. *Werner Däppen, Lawrence Anderson, and Dimitri Mihalas*. **319**, 195, 95-B6 (1987)
- DAR, ARNON. Neutrino Annihilation in Type II Supernovae. *Jeremy Goodman, Arnon Dar, and Shmuel Nussinov*. **314**, L7, 33-B9 (1987)
- DAUB, C. T. Temperature and Emission-Measure Distributions for Several Planetary Nebulae. *J. P. Basart and C. T. Daub*. **317**, 412, 68-D14 (1987)
- DAVID, LAURENCE P. The Evolution of Active Galactic Nuclei. I. Models without Stellar Evolution. *Laurence P. David, Richard H. Durisen, and Haldan N. Cohn*. **313**, 556, 22-G9 (1987)
- The Evolution of Active Galactic Nuclei. II. Models with Stellar Evolution. *Laurence P. David, Richard H. Durisen, and Haldan N. Cohn*. **316**, 505, 57-E4 (1987)
- DAVIDSON, J. A. Low-Luminosity Embedded Sources and Their Environments. *J. A. Davidson*. **315**, 602, 47-C4 (1987)
- DAVIDSON, KRIS. The Relation between Apparent Temperature and Mass-Loss Rate in Hypergiant Eruptions. *Kris Davidson*. **317**, 760, 74-C12 (1987)
- DAVIES, ROGER L. Spectroscopy and Photometry of Elliptical Galaxies. I. New Distance Estimator. *Alan Dressler, Donald Lynden-Bell, David Burstein, Roger L. Davies, S. M. Faber, Roberto Terlevich, and Gary Wegner*. **313**, 42, 15-D7 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies: A Large-Scale Streaming Motion in the Local Universe. *Alan Dressler, S. M. Faber, David Burstein, Roger L. Davies, Donald Lynden-Bell, R. J. Terlevich, and Gary Wegner*. **313**, L37, 27-A9 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies. II. The Spectroscopic Parameters. *Roger L. Davies, David Burstein, Alan Dressler, S. M. Faber, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner*. **64**, 581, 26-B1 (1987) (Abstr. in **318**, 944, 91-C9)
- Spectroscopy and Photometry of Elliptical Galaxies. III. UBV Aperture Photometry, CCD Photometry, and Magnitude-related Parameters. *David Burstein, Roger L. Davies, Alan Dressler, S. M. Faber, Remington P. S. Stone, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner*. **64**, 601, 26-C7 (1987) (Abstr. in **318**, 944, 91-C9)
- DAVILA, JOSEPH M. Heating of the Solar Corona by the Resonant Absorption of Alfvén Waves. *Joseph M. Davila*. **317**, 514, 69-E4 (1987)
- DAVIS, ANDREW M. Large Negative ^{50}Ti Anomalies in Refractory Inclusions from the Murchison Carbonaceous Chondrite: Evidence for Incomplete Mixing of Neutron-rich Supernova Ejecta into the Solar System. *Richard W. Hinton, Andrew M. Davis, and Debra E. Scatena-Wachel*. **313**, 420, 19-E12 (1987)
- DAVIS, C. G. Application of Time-dependent Fourier Analysis to Nonlinear Pulsational Stellar Models. *G. Kovács, J. R. Buchler, and C. G. Davis*. **319**, 247, 95-F6 (1987)
- DAVIS, J. M. The Plasma and Magnetic Field Properties of Coronal Loops Observed at High Spatial Resolution. *D. F. Webb, G. D. Holman, J. M. Davis, M. R. Kundu, and R. K. Sheegaonkar*. **315**, 716, 48-D11 (1987)
- DAVIS, JOHN H. Submillimeter Spectral Line Observations in Very Dense Regions. *Neal J. Evans II, Lee G. Mundy, John H. Davis, and Paul Vanden Bout*. **312**, 344, 4-E13 (1987)
- DAVIS, MARC. Fundamental Properties of Elliptical Galaxies. *S. Djorgovski and Marc Davis*. **313**, 59, 15-E14 (1987)
- Clusters, Filaments, and Voids in a Universe Dominated by Cold Dark Matter. *Simon D. M. White, Carlos S. Frenk, Marc Davis, and George Efstathiou*. **313**, 505, 22-C11 (1987)
- DAVIS, SUMNER P. The Near-Infrared Spectrum of the FeH Molecule. *John G. Phillips, Sumner P. Davis, Bo Lindgren, and Walter J. Balfour*. **65**, 721, 39-F2 (1987) (Abstr. in **322**, 1077, 151-G3)
- DAWSON, B. R. Sporadic and Periodic 10-1000 TeV Gamma Rays From Cygnus X-3. *R. M. Baltrusaitis, G. L. Cassiday, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebong, C. P. Lingle, E. C. Loh, P. Sokolsky, P. Sommers, and D. Steck*. **323**, 685, 162-C1 (1987)
- DE AMICI, GIOVANNI. Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. *George F. Smoot, Marc Bershadoun, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Witebsky*. **317**, L45, 78-A9 (1987)

- DEBRUNNER, H. Solar Neutron Emissivity During the Large Flare on 1982 June 3. *E. L. Chupp, H. Debrunner, E. Flückiger, D. J. Forrest, F. Golitz, G. Kanbach, W. T. Vestrand, J. Cooper, and G. Share*. **318**, 913, 91-A1 (1987)
- DECHER, R. Star Formation in the Magellanic Irregular Galaxy NGC 4449. *Harley A. Thronson, Jr., Deidre A. Hunter, C. M. Telesco, D. A. Harper, and R. Decher*. **317**, 180, 66-A3 (1987)
- DEETER, J. E. Apsidal Advance in Vela X-1. *J. E. Deeter, P. E. Boynton, F. K. Lamb, and G. Zylstra*. **314**, 634, 36-E1 (1987)
- DEFORREST, ALLEN. The Perseus Flasher and Satellite Glints. *Bradley E. Schaefer, Michael Barber, John J. Brooks, Allen DeForrest, Paul D. Maley, Norman W. McLeod III, Russ McNiel, Andrew J. Noymer, A. K. Presnell, Richard Schwartz, and Scott Whitney*. **320**, 398, 112-D2 (1987)
- DEFREES, D. J. Ion-Molecule Calculation of the Abundance Ratio of CCD to CCH in Dense Interstellar Clouds. *Eric Herbst, Nigel G. Adams, David Smith, and D. J. DeFrees*. **312**, 351, 4-F7 (1987)
- A Detailed Investigation of Proposed Gas-Phase Syntheses of Ammonia in Dense Interstellar Clouds. *Eric Herbst, D. J. DeFrees, and A. D. McLean*. **321**, 898, 134-D4 (1987)
- Collisional Excitation of Interstellar Cyclopropenylidene. *Sheldon Green, D. J. DeFrees, and A. D. McLean*. **65**, 175, 29-F11 (1987) (Abstr. in **319**, 1013, 106-A11)
- DE GEUS, E. J. A Composite CO Survey of the Entire Milky Way. *T. M. Dame, H. Ungerechts, R. S. Cohen, E. J. de Geus, I. A. Grenier, J. May, D. C. Murphy, L.-A. Nyman, and P. Thaddeus*. **322**, 706, 147-D13 (1987)
- DEGUCHI, S. Water Maser Emission toward V788 Cygni, A Carbon Star. *Y. Nakada, H. Izumiura, T. Onaka, O. Hashimoto, N. Ukita, S. Deguchi, and T. Tanabé*. **323**, L77, 158-F6 (1987)
- DEGUCHI, SHUJI. Electron Scintillation in Gravitationally Lensed Images of Astrophysical Radio Sources. *Shuji Deguchi and William D. Watson*. **315**, 440, 45-E4 (1987)
- DEJONGHE, HERWIG. On Entropy and Stellar Systems. *Herwig Dejonghe*. **320**, 477, 114-F3 (1987)
- DEKEL, AVISHAI. Gravitational Lenses and Decay of Dark Matter. *Avishai Dekel and Tsui Piran*. **315**, L83, 49-B6 (1987)
- Profiles of Clusters of Galaxies: Cosmological Scenarios versus Observations. *Michael J. West, Avishai Dekel, and Augustus Oemler, Jr.* **316**, 1, 50-A8 (1987)
- DELPINO, F. Preliminary VLA Limits on the Sunyaev-Zel'dovich Effect in Abell 2218. *R. B. Partidge, R. A. Perley, N. Mandolesi, and F. Delpino*. **317**, 112, 65-B11 (1987)
- DE LUCIA, FRANK C. C-Type Transitions in Methyl Formate. *Grant M. Plummer, Eric Herbst, and Frank C. De Lucia*. **318**, 873, 90-E3 (1987)
- The Laboratory Millimeter- and Submillimeter-Wave Spectrum of ^{13}C Methanol. *Todd Anderson, Eric Herbst, and Frank C. De Lucia*. **64**, 703, 27-E4 (1987) (Abstr. in **318**, 946, 91-C11)
- DEMARQUE, P. The Evolution of Red Clump Stars: Theoretical Sequences. *E. Seidel, P. Demarque, and D. Weinberg*. **63**, 917, 15-B13 (1987) (Abstr. in **314**, 832, 38-F8)
- DEMARQUE, PIERRE. Intermediate-Age Core Helium Burning Stars and the Distance to the Magellanic Clouds. *E. Seidel, G. S. Da Costa, and Pierre Demarque*. **313**, 192, 17-B1 (1987)
- DEMING, DRAKE. On the Apparent Velocity of Integrated Sunlight. *I. 1983-1985. Drake Deming, Fred Espenak, Donald E. Jennings, James W. Brault, and Jeremy Wagner*. **316**, 771, 60-E4 (1987)
- DENNIS, B. Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. *J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Kouveliotou, T. Cline, B. Dennis, U. Desai, and L. Orwig*. **320**, L105, 121-C7 (1987)
- DENNIS, B. R. A New Type of Repetitive Behavior in a High-Energy Transient. *J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Kouveliotou, T. L. Cline, B. R. Dennis, U. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. **320**, L111, 121-C13 (1987)
- The High-Energy X-Ray Spectrum of Black Hole Candidate GX 339-4 during a Transition. *J. F. Dolan, C. J. Crannell, B. R. Dennis, and L. E. Orwig*. **322**, 324, 141-D1 (1987)
- SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806-20. *C. Kouveliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Neil, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. **322**, L21, 145-B8 (1987)
- DENNISON, BRIAN. Evidence for Refractive Scintillation of Two Extragalactic Sources Seen through the Galactic Disk. *Brian Dennison, R. Fiedler, K. J. Johnston, J. H. Spencer, E. B. Waltman, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. **313**, 141, 16-E5 (1987)
- DE OLIVEIRA, A. K. G. Nonadiabatic Gravitational Collapse. *A. K. G. de Oliveira and N. O. Santos*. **312**, 640, 10-A1 (1987)
- DEPOY, D. L. Discovery of Broad Brackett- α Emission in Arp 220. *D. L. DePoy, E. E. Becklin, and T. R. Geballe*. **316**, L63, 62-B8 (1987)
- DERMER, C. D. On the Origin of the Pion-Decay Radiation in the 1982 June 3 Solar Flare. *R. Ramaty, R. J. Murphy, and C. D. Derman*. **316**, L41, 56-D3 (1987)
- High-Energy Processes in Solar Flares. *R. J. Murphy, C. D. Derman, and R. Ramaty*. **63**, 721, 11-D13 (1987) (Abstr. in **313**, 931, 26-G14)
- DERMER, CHARLES D. On the Relationship of Flare Size and Particle Anisotropy in Solar Gamma-Ray Flares. *Charles D. Derman*. **323**, 795, 163-D10 (1987)
- DE ROBERTIS, M. M. Spectroscopy and Imaging of Markarian 78 and I Zw 92. *M. M. De Robertis*. **316**, 597, 58-E7 (1987)
- DESAI, U. Gamma-Ray Burst Counterparts: Infrared. *Bradley E. Schaefer, T. L. Cline, U. Desai, B. J. Teegarden, J.-L. Atteia, C. Barat, K. Hurley, M. Niel, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, I. V. Estulin, and A. V. Kuznetsov*. **313**, 226, 17-D9 (1987)
- Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. *J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Kouveliotou, T. Cline, B. Dennis, U. Desai, and L. Orwig*. **320**, L105, 121-C7 (1987)
- DESAI, U. D. A New Type of Repetitive Behavior in a High-Energy Transient. *J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Kouveliotou, T. L. Cline, B. R. Dennis, U. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. **320**, L111, 121-C13 (1987)
- SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806-20. *C. Kouveliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Neil, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. **322**, L21, 145-B8 (1987)
- DESAI, UPENDRA D. Short Solar Events with Evidence of Repetitive Structures. *Upendra D. Desai, Chryssa Kouveliotou, C. Barat, K. Hurley, M. Niel, R. Talon, G. Vedrenne, I. V. Estulin, and V. Ch. Dolidze*. **319**, 567, 99-E1 (1987)
- DESSANUET, VICTOR H. Tidal Stripping and Accretion in Clusters of Galaxies with Smoothly Distributed Missing Mass. *Juan C. Muzzio, Victor H. Dessanuet, and M. Marcela Vergne*. **313**, 112, 16-C4 (1987)
- DEUPREE, ROBERT G. The Core Helium Flash and Surface Abundance Anomalies. *Robert G. Deupree and Richard K. Wallace*. **317**, 724, 74-A4 (1987)
- DEUTSCH, L. K. Far-Infrared Luminosities of Markarian Starburst Galaxies. II. Individual Galaxies. *L. K. Deutsch and S. P. Willner*. **63**, 803, 13-E14 (1987) (Abstr. in **314**, 831, 38-F7)
- DEVEREUX, NICHOLAS A. Infrared Characteristics of the Nuclei of Normal Galaxies. *Nicholas A. Devereux, E. E. Becklin, and Nick Scoville*. **312**, 529, 8-F3 (1987)
- DEVEREUX, NICHOLAS. The Spatial Distribution of 10 Micron Luminosity in Spiral Galaxies. *Nicholas Devereux*. **323**, 91, 154-B1 (1987)
- DEVORE, C. R. Nonlinear Evolution of Radiation-driven Thermally Unstable Fluids. *R. B. Dahlburg, C. R. DeVore, J. M. Picone, J. T. Mariska, and J. T. Karpen*. **315**, 385, 44-B5 (1987)
- DEVORE, C. RICHARD. Nonlocal Thermal Transport in Solar Flares. *Judith T. Karpen and C. Richard DeVore*. **320**, 904, 119-F3 (1987)
- DE VRIES, HENDRIK WILLEM. Molecular and Atomic Clouds Associated with Infrared Cirrus in Ursa Major. *Hendrik Willem de Vries, Andreas Heithausen, and Patrick Thaddeus*. **319**, 723, 103-A1 (1987)
- DEWEY, R. J. Monte Carlo Simulations of Radio Pulsars and Their Progenitors. *R. J. Dewey and J. M. Cordes*. **321**, 780, 133-A14 (1987)
- DE ZEEUW, P. T. Nonuniqueness of Self-consistent Equilibrium Solutions for the Perfect Elliptic Disk. *P. T. de Zeeuw, C. Hunter, and M. Schwarzschild*. **317**, 607, 72-F11 (1987)
- DE ZOTTI, G. Interpretation of Deep Counts of Radio Sources. *L. Danese, G. De Zotti, A. Franceschini, and L. Toffolatti*. **318**, L15, 85-B2 (1987)
- DIAMOND, P. J. H₂O Masers in Circumstellar Envelopes. *Adair P. Lane, K. J. Johnston, P. F. Bowers, J. H. Spencer, and P. J. Diamond*. **323**, 756, 163-A8 (1987)
- DICKE, R. H. Is the Solar Oblateness Variable? Measurements of 1985. *R. H. Dicke, J. R. Kuhn, and K. G. Libbrecht*. **318**, 451, 83-G9 (1987)
- Observations of a Solar Latitude-dependent Limb Brightness Variation: Erratum. *J. R. Kuhn, K. G. Libbrecht, and R. H. Dicke*. **319**, 1010, 106-A8 (1987) (Orig. paper in **290**, 758, 32-C8)
- DICKEL, JOHN R. Resolution of Compact Knots in Cassiopeia A. *Richard G. Arendt and John R. Dickel*. **315**, 567, 46-G8 (1987)

- DICKENS, R. J. Overtone Pulsation in Stars. *R. F. Stellingwerf, A. Gautschi, and R. J. Dickens*. **313**, L75, 27-D2 (1987)
- Fourier Coefficients of the RR Lyrae Variables in NGC 6171. *R. F. Stellingwerf and R. J. Dickens*. **322**, 133, 139-D2 (1987)
- DICKEY, J. M. 1.4 GHz Continuum Sources in the Cancer Cluster. *E. E. Salpeter and J. M. Dickey*. **317**, 102, 65-B1 (1987)
- DICKEY, JOHN M. Arecibo Observations of IRAS Galaxies at 21 and 18 Centimeters Wavelengths. *Robert W. Garwood, George Helou, and John M. Dickey*. **322**, 88, 138-G11 (1987)
- DICKINSON, DALE F. Pumping the Stellar Hydroxyl Maser. *Dale F. Dickinson*. **313**, 408, 19-D13 (1987)
- High-Excitation SiO Masers in Evolved Stars. *P. R. Jewell, Dale F. Dickinson, L. E. Snyder, and D. P. Clemens*. **323**, 749, 163-A1 (1987)
- DICKMAN, R. L. Small-Scale Structure of the Taurus Molecular Clouds: Turbulence in Heiles' Cloud 2. *S. C. Kleiner and R. L. Dickman*. **312**, 837, 12-B2 (1987)
- Molecular Clouds and the Gould Belt. *David K. Taylor, R. L. Dickman, and N. Z. Scoville*. **315**, 104, 41-B2 (1987)
- VLBI Structure of 3C 84 at 89 GHz. *D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman*. **322**, 74, 138-F11 (1987)
- Velocity Waves in 21 Centimeter Self-Absorption toward the Taurus Molecular Complex. *W. L. H. Shuter, R. L. Dickman, and C. Klatt*. **322**, L103, 152-D8 (1987)
- DIEHL, R. Centaurus A Observation at MeV- Gamma-Ray Energies. *P. von Ballmoos, R. Diehl, and V. Schönfelder*. **312**, 134, 2-D11 (1987)
- Map of the Galactic Center Region in the 1.8 MeV ^{26}Al Gamma-Ray Line. *P. von Ballmoos, R. Diehl, and V. Schönfelder*. **318**, 654, 88-B1 (1987)
- DINERSTEIN, H. L. Physical Processes and Infrared Emission from the Cassiopeia A Supernova Remnant. *E. Dwek, H. L. Dinerstein, F. C. Gillett, M. G. Hauser, and W. L. Rice*. **315**, 571, 47-A1 (1987)
- The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. *R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Leoreault*. **317**, 355, 67-F14 (1987)
- Far-Infrared Measurements of N/O in H II Regions: Evidence for Enhanced CN Process Nucleosynthesis in the Inner Galaxy. *D. F. Lester, H. L. Dinerstein, M. W. Werner, D. M. Watson, R. Genzel, and J. W. V. Storey*. **320**, 573, 116-A1 (1987)
- DINERSTEIN, HARRIET L. Observations of Infrared Emission from a Fast-moving Knot in Cassiopeia A. *Harriet L. Dinerstein, Daniel F. Lester, David M. Rank, Michael W. Werner, and Diane H. Wooden*. **312**, 314, 4-C11 (1987)
- DJORGOSKI, S. Fundamental Properties of Elliptical Galaxies. *S. Djorgovski and Marc Davis*. **313**, 59, 15-E14 (1987)
- Discovery of Three Obscured Globular Clusters. *S. Djorgovski*. **317**, L13, 71-B2 (1987)
- Extended Lyman- α Emission in 3C 326.1: A 100 Kiloparsec Cloud of Ionized Gas at a Redshift of 1.82. *Patrick J. McCarthy, Hyron Spinrad, S. Djorgovski, Michael A. Strauss, Wil van Breugel, and James Liebert*. **319**, L39, 107-B2 (1987)
- Discovery of a Probable Binary Quasar. *S. Djorgovski, R. Perley, G. Meylan, and P. McCarthy*. **321**, L17, 129-C6 (1987)
- A Correlation between the Radio and Optical Morphologies of Distant 3CR Radio Galaxies. *Patrick J. McCarthy, Wil van Breugel, Hyron Spinrad, and S. Djorgovski*. **321**, L29, 129-D3 (1987)
- A Preliminary Survey of Collapsed Cores in the Magellanic Clouds' Globular Clusters. *G. Meylan and S. Djorgovski*. **322**, L91, 152-C10 (1987)
- DODERO, M. A. Simulations of the Ca XIX Spectral Emission from a Flaring Solar Coronal Loop. I. Thermal Case. *E. Antonucci, M. A. Dodero, G. Peres, S. Serio, and R. Rosner*. **322**, 522, 143-F1 (1987)
- DOLAN, J. F. The High-Energy X-Ray Spectrum of Black Hole Candidate GX 339 - 4 during a Transition. *J. F. Dolan, C. J. Crannell, B. R. Dennis, and L. E. Örwig*. **322**, 324, 141-D1 (1987)
- DOLIDZE, V. Ch. Short Solar Events with Evidence of Repetitive Structures. *Upendra D. Desai, Chryssa Kouveliotou, C. Barot, K. Hurley, M. Niel, R. Talon, G. Vedrenne, I. V. Estulin, and V. Ch. Dolidze*. **319**, 567, 99-E1 (1987)
- DOMÍNGUEZ-TENREIRO, R. Light-Element Yields with Cosmological Decaying Gravitinos. *R. Domínguez-Tenreiro*. **313**, 523, 22-E1 (1987)
- Antimatter and Light Element Yields: Could Dark Matter be Baryonic? *R. Domínguez-Tenreiro and G. Yepes*. **317**, L1, 71-A4 (1987)
- DOMINY, JAMES F. Carbon ($^{12}\text{C}/^{13}\text{C}$) and Oxygen ($^{16}\text{O}/^{17}\text{O}$) Isotopic Ratios in Seven Evolved Stars. *James F. Dominy and George Wallerstein*. **317**, 810, 74-G11 (1987)
- DONAHUE, MEGAN. Can Quasars Ionize the Intergalactic Medium? *Megan Donahue and J. Michael Shull*. **323**, L13, 158-B1 (1987)
- DONNELLY, R. HANK. 6 Centimeter Radio Source Counts and Spectral Index Studies Down to 0.1 Millijansky. *R. Hank Donnelly, R. Bruce Partridge, and Rogier A. Windhorst*. **321**, 94, 123-B9 (1987)
- DONOHUE, M. Fourier Coefficients of Variable Stars. II. Light-Curve Analysis. *R. F. Stellingwerf and M. Donohue*. **314**, 252, 30-G8 (1987)
- DOPITA, M. A. H II Region Abundances in Seyfert Galaxies. *I. N. Evans and M. A. Dopita*. **319**, 662, 102-B12 (1987)
- Angular Diameters and Fluxes of Magellanic Cloud Planetary Nebulae. II. High-Speed Direct Imaging. *P. R. Wood, S. J. Meatheringham, M. A. Dopita, and D. H. Morgan*. **320**, 178, 110-A11 (1987)
- The Ionization Effects of Shock Breakout in SN 1987A. *M. A. Dopita, S. J. Meatheringham, P. Nulsen, and P. R. Wood*. **322**, L85, 152-C5 (1987)
- DOPITA, MICHAEL A. New Evolutionary Relationships for Magellanic Cloud Planetary Nebulae. *Michael A. Dopita, Stephen J. Meatheringham, Peter R. Wood, B. Louise Webster, David H. Morgan, and Holland C. Ford*. **315**, L107, 49-D2 (1987)
- DORREN, J. D. A New Formulation of the Starspot Model, and the Consequences of Starspot Structure. *J. D. Dorren*. **320**, 756, 118-A11 (1987)
- DOSCHEK, G. A. The Temperature of Solar Flares Determined from X-Ray Spectral Line Ratios. *G. A. Doschek and U. Feldman*. **313**, 883, 26-D7 (1987)
- Ultraviolet Al III Emission Lines and the Physics of the Solar Transition Region. *G. A. Doschek and U. Feldman*. **315**, L67, 45-F5 (1987)
- Observation of Nonthermal Energy Distributions during the Impulsive Phase of Solar Flares. *J. F. Seely, U. Feldman, and G. A. Doschek*. **319**, 541, 99-B9 (1987)
- Transient Ionization and Solar Flare X-Ray Spectra. *G. A. Doschek and K. Tanaka*. **323**, 799, 163-E1 (1987)
- DOUTHAT, DARYL A. Initial Vibrational and Rotational Yields from Subexcitation Electrons in Molecular Hydrogen. *Daryl A. Douthat*. **314**, 419, 32-F13 (1987)
- DOVE, J. E. Excitation and Dissociation of Molecular Hydrogen in Shock Waves at Interstellar Densities. *J. E. Dove, A. C. M. Rusk, P. H. Cribb, and P. G. Martin*. **318**, 379, 83-A11 (1987)
- DOWNES, R. A. The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. *R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Leoreault*. **317**, 355, 67-F14 (1987)
- DOWNES, RONALD A. The Stars with H α Missing. *Ronald A. Downes*. **316**, 763, 60-D8 (1987)
- Further Observations of the Peculiar Hot Helium-rich Degenerate KPD 0005 + 5106. *Ronald A. Downes, Edward M. Sion, James Liebert, and J. B. Holberg*. **321**, 943, 134-G7 (1987)
- DRACH, J. Elemental Technetium and Promethium as Cosmic-Ray Clocks. *J. Drach and M. H. Salamon*. **319**, 237, 95-E9 (1987)
- DRAINE, B. T. Optical Properties of Interstellar Graphite and Silicate Grains: Erratum. *B. T. Draine and Hyung Mok Lee*. **318**, 485, 84-C4 (1987) (Orig. paper in **285**, 89, 111-A3)
- Collisional Charging of Interstellar Grains. *B. T. Draine and Brian Sutin*. **320**, 803, 118-E5 (1987)
- Oblique Magnetohydrodynamic Shock Waves in Molecular Clouds. *Mark Wardle and B. T. Draine*. **321**, 321, 125-F8 (1987)
- Tabulated Optical Properties of Graphite and Silicate Grains: Erratum. *B. T. Draine*. **64**, 505, 23-C11 (1987) (Abstr. in **289**, 861, 21-F4)
- DRAKE, STEPHEN A. The Discovery of Nonthermal Radio Emission from Magnetic Bp-Ap Stars. *Stephen A. Drake, David C. Abbott, T. S. Bastian, J. H. Bieging, E. Churchwell, G. Dulk, and Jeffrey L. Linsky*. **322**, 902, 149-F10 (1987)
- DRAPER, P. W. Polarimetry of the NGC 2261/R Monocerotis System and the Faint Jetlike Feature to its Southwest. *R. F. Warren-Smith, P. W. Draper, and S. M. Scarrott*. **315**, 500, 46-B11 (1987)
- DREHER, J. W. The Faraday Rotation of Cygnus A: Magnetic Fields in Cluster Gas. *J. W. Dreher, C. L. Carilli, and R. A. Perley*. **316**, 611, 58-F7 (1987)
- DRESSLER, ALAN. Spectroscopy and Photometry of Elliptical Galaxies. I. New Distance Estimator. *Alan Dressler, Donald Lynden-Bell, David Burstein, Roger L. Davies, S. M. Faber, Roberto Terlevich, and Gary Wegner*. **313**, 42, 15-D7 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies: A Large-Scale Streaming Motion in the Local Universe. *Alan Dressler, S. M. Faber, David Burstein, Roger L. Davies, Donald Lynden-Bell, R. J. Terlevich, and Gary Wegner*. **313**, L37, 27-A9 (1987)
- The D_n - σ Relation for Bulges of Disk Galaxies: A New, Independent Measure of the Hubble Constant. *Alan Dressler*. **317**, 1, 64-A7 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies. II. The Spectroscopic Parameters. *Roger L. Davies, David Burstein, Alan Dressler, S. M. Faber, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner*. **64**, 581, 26-B1 (1987) (Abstr. in **318**, 944, 91-C9)
- Spectroscopy and Photometry of Elliptical Galaxies. III. UVB Aperture

- Photometry, CCD Photometry, and Magnitude-related Parameters. David Burstein, Roger L. Davies, Alan Dressler, S. M. Faber, Remington P. S. Stone, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner. **64**, 601, 26-C7 (1987) (Abstr. in **318**, 944, 91-C9)
- DRISSEN, LAURENT. Polarization Variability among Wolf-Rayet Stars. I. Linear Polarization of a Complete Sample of Southern Galactic WC Stars. Nicole St-Louis, Laurent Drissen, Anthony F. J. Moffat, Pierre Bastien, and Santiago Tapia. **322**, 870, 149-C13 (1987)
- Polarization Variability among Wolf-Rayet Stars. II. Linear Polarization as a Complete Sample of Southern Galactic WN Stars. Laurent Drissen, Nicole St-Louis, Anthony F. J. Moffat, and Pierre Bastien. **322**, 888, 149-E5 (1987)
- DRYER, M. Theoretical Non-Maxwellian Particle Velocity Distribution Functions for Spherically Symmetric Solar Wind-like Plasma Systems and Consequences. II. The Case of Large Thermal Anisotropy and Nine Moments Description for Each Species. S. Cuperman, H. Yatou, M. Dryer, and D. Lewis. **314**, 404, 32-E11 (1987)
- DUFFY, P. B. Far-Infrared Spectroscopy of Star Formation Regions in M82. P. B. Duffy, E. F. Erickson, M. R. Haas, and J. R. Houck. **315**, 68, 40-F6 (1987)
- DULEY, W. W. A 217.5 Nanometer Absorption Feature in the Spectrum of Small Silicate Particles. T. M. Steel and W. W. Duley. **315**, 337, 43-E8 (1987)
- DULK, G. The Discovery of Nonthermal Radio Emission from Magnetic Bp-Ap Stars. Stephen A. Drake, David C. Abbott, T. S. Bastian, J. H. Bieging, E. Churchwell, G. Dulk, and Jeffrey L. Linsky. **322**, 902, 149-F10 (1987)
- DUNAWAY, M. H. Discovery of Optical Circular Polarization in Lambda Andromedae. J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook. **317**, L29, 71-C2 (1987)
- DUNCAN, D. K. The Activity, Variability, and Rotation of Lower Main-Sequence Hyades Stars. Richard R. Radick, D. T. Thompson, G. W. Lockwood, D. K. Duncan, and W. E. Baggett. **321**, 459, 127-B10 (1987)
- DUNCAN, DOUGLAS K. The Lithium Abundance in Halo Stars. L. M. Hobbs and Douglas K. Duncan. **317**, 796, 74-F10 (1987)
- The Pleiades Rapid Rotators: Evidence for an Evolutionary Sequence. R. Paul Butler, Ross D. Cohen, Douglas K. Duncan, and Geoffrey W. Marcy. **319**, L19, 100-B9 (1987)
- DUNPHY, P. P. Gamma-Ray Observations of the Crab Region Using a Coded-Aperture Telescope. M. L. McConnell, P. P. Dunphy, D. J. Forrest, E. L. Chupp, and A. Owens. **321**, 543, 128-A13 (1987)
- DUPREE, A. K. Periodic Photospheric and Chromospheric Modulation in Alpha Orionis (Betelgeuse). A. K. Dupree, S. L. Balunas, E. F. Guinan, L. Hartmann, G. E. Nassiopoulos, and G. Sonneborn. **317**, L86, 78-D4 (1987)
- The Interstellar Medium toward Supernova 1987A. A. K. Dupree, R. P. Kirshner, G. E. Nassiopoulos, J. C. Raymond, and G. Sonneborn. **320**, 597, 116-B11 (1987)
- DUPUIS, J. Selective Mass Loss, Abundance Anomalies, and Helium-rich Stars. G. Michaud, J. Dupuis, G. Fontaine, and T. Montmerle. **322**, 302, 141-B7 (1987)
- DURIC, N. Evidence for Ram Pressure Stripping of NGC 3073 by Outflowing Gas from NGC 3079. Judith A. Irwin, E. R. Seaquist, A. R. Taylor, and N. Duric. **313**, L91, 27-E3 (1987)
- DURISEN, R. H. X-Ray and Ultraviolet Radiation from Accreting White Dwarfs. IV. Two-Temperature Treatment with Electron Thermal Conduction. J. N. Imamura, R. H. Durisen, D. Q. Lamb, and G. J. West. **313**, 298, 18-B14 (1987)
- DURISEN, RICHARD H. The Evolution of Active Galactic Nuclei. I. Models without Stellar Evolution. Laurence P. David, Richard H. Durisen, and Haldan N. Cohn. **313**, 556, 22-G9 (1987)
- The Evolution of Active Galactic Nuclei. II. Models with Stellar Evolution. Laurence P. David, Richard H. Durisen, and Haldan N. Cohn. **316**, 505, 57-E4 (1987)
- DUVALL, T. L., JR. Acoustic Absorption by Sunspots. D. C. Braun, T. L. Duvall, Jr., and B. J. LaBonte. **319**, L27, 100-C9 (1987)
- DWEK, E. Physical Processes and Infrared Emission from the Cassiopeia A Supernova Remnant. E. Dwek, H. L. Dinerstein, F. C. Gillett, M. G. Hauser, and W. L. Rice. **315**, 571, 47-A1 (1987)
- Large-Scale Galactic Dust Morphology and Physical Conditions from IRAS Observations. T. J. Soderoski, E. Dwek, M. G. Hauser, and F. J. Kerr. **322**, 101, 139-A10 (1987)
- DWEK, ELI. IRAS Observations of Supernova Remnants: A Comparison between Their Infrared and X-Ray Cooling Rates. Eli Dwek, Robert Petre, Andrew Szymkowiak, and Walter L. Rice. **320**, 27, 114-C4 (1987)
- The Infrared Diagnostic of a Dusty Plasma with Applications to Supernova Remnants. Eli Dwek. **322**, 812, 148-F6 (1987)
- DWYER, ROBERT. Cosmic-Ray Elemental Abundances from 1 to 10 GeV per AMU for Boron through Nickel. Robert Dwyer and Peter Meyer. **322**, 981, 150-E12 (1987)
- DYE, S. T. see SVOBODA, R. et al.
- ECKART, A. 1928 + 738: A Superluminal Source with Large-Scale Structure. K. J. Johnston, R. S. Simon, A. Eckart, P. Biermann, C. Schalinski, A. Witzel, and R. G. Strom. **313**, L85, 27-D11 (1987)
- ECKART, ANDREAS. The H α Chromosphere of Alpha Orionis. Jeremy C. Hebdan, Andreas Eckart, and E. Keith Hege. **314**, 690, 37-B10 (1987)
- EDELSON, R. A. Broad-Band Properties of the Cfa Seyfert Galaxies. I. Radio Properties. R. A. Edelson. **313**, 651, 24-A1 (1987)
- Broad-Band Properties of the Cfa Seyfert Galaxies. II. Infrared to Millimeter Properties. R. A. Edelson, M. A. Malkan, and G. H. Rieke. **321**, 233, 124-G1 (1987)
- Far-Infrared Variability in Active Galactic Nuclei. R. A. Edelson and M. A. Malkan. **323**, 516, 160-B14 (1987)
- EDVARDSSON, B. Spectroscopy of the Rapidly Rotating K Star HD 36705. O. Vilhu, B. Gustafsson, and B. Edvardsson. **320**, 850, 119-B5 (1987)
- EDWARDS, SUZAN. Forbidden Line and H α Profiles in T Tauri Star Spectra: A Probe of Anisotropic Mass Outflows and Circumstellar Disks. Suzan Edwards, Sylvie Cabrit, Stephen E. Strom, Ingeborg Heyer, Karen M. Strom, and E. Anderson. **321**, 473, 127-C10 (1987)
- EFTATHIOU, G. Cosmic Fluctuation Spectra with Large-Scale Power. J. M. Bardeen, J. R. Bond, and G. Efstathiou. **321**, 28, 122-D1 (1987)
- EFTATHIOU, GEORGE. Clusters, Filaments, and Voids in a Universe Dominated by Cold Dark Matter. Simon D. M. White, Carlos S. Frenk, Marc Davis, and George Efstathiou. **313**, 505, 22-C11 (1987)
- Angular Momentum from Tidal Torques. Joshua Barnes and George Efstathiou. **319**, 575, 101-C1 (1987)
- EGGM, G. E. Radiation-Hydrodynamic Calculation of Sub-Eddington Accretion Disks. G. E. Eggum, F. V. Coroniti, and J. I. Katz. **323**, 634, 161-F1 (1987)
- EICHLER, DAVID. Distributed Reacceleration of Cosmic Rays. Amri Wandel, David Eichler, John R. Letaw, Rein Silberberg, and C. H. Tsao. **316**, 676, 59-D13 (1987)
- Very High Energy Gamma-Ray Spectroscopy. David Eichler and James H. Adams, Jr. **317**, 551, 70-A1 (1987)
- EINAUDI, G. Alfvén Wave Dissipation in the Solar Atmosphere. G. Einaudi and Yung Mok. **319**, 520, 99-A1 (1987)
- EISENHARDT, PETER R. M. Color Evolution in High-Redshift Galaxies. Peter R. M. Eisenhardt and M. J. Lebofsky. **316**, 70, 50-F14 (1987)
- EKERS, R. D. H I Gas near the Giant Elliptical Galaxy NGC 4472. R. Sancisi, N. Thonnard, and R. D. Ekers. **315**, L39, 45-D8 (1987)
- ELBERT, J. W. Sporadic and Periodic 10–1000 TeV Gamma Rays From Cygnus X-3. R. M. Baltrusaitis, G. L. Cassidy, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebing, C. P. Lingle, E. C. Loh, P. Sokolsky, P. Sommers, and D. Steck. **323**, 685, 162-C1 (1987)
- ELIAS, J. H. IRAS 00521 – 7054: An Unusually Warm Galaxy. Jay A. Frogel and J. H. Elias. **313**, L53, 27-B10 (1987)
- The IRAS Bright Galaxy Sample. II. The Sample and Luminosity Function. B. T. Soifer, D. B. Sanders, B. F. Madore, G. Neugebauer, G. E. Danielson, J. H. Elias, Carol J. Lonsdale, and W. L. Rice. **320**, 238, 110-F7 (1987)
- ELLIS, G. F. R. Note on "Symmetry Changes in Friedmann Cosmologies" by S. S. Bayin. G. F. R. Ellis. **314**, 1, 28-A7 (1987)
- ELLIS, H. B., JR. Far-Infrared Continuum Emission from the Nucleus, Starburst, and Extended Spiral Arms of NGC 1068. D. F. Lester, M. Joy, P. M. Harvey, H. B. Ellis, Jr., and P. S. Parmar. **321**, 755, 132-G1 (1987)
- ELLISON, B. N. CO Emission from Centaurus A. T. G. Phillips, B. N. Ellison, J. B. Keene, R. B. Leighton, R. J. Howard, C. R. Masson, D. B. Sanders, B. Veidt, and K. Young. **322**, L73, 152-B8 (1987)
- ELLISON, DONALD C. Diffusive Shock Acceleration: Comparison of a Unified Shock Model to Bow Shock Observations. Donald C. Ellison and Eberhard Möbius. **318**, 474, 84-B6 (1987)
- ELMEGREEN, BRUCE G. Supercloud Formation by Nonaxisymmetric Gravitational Instabilities in Sheared Magnetic Galaxy Disks. Bruce G. Elmegreen. **312**, 626, 9-F10 (1987)
- Arm Classifications for Spiral Galaxies. Debra Meloy Elmegreen and Bruce G. Elmegreen. **314**, 3, 28-A10 (1987)
- H I Superclouds in the Inner Galaxy. Bruce G. Elmegreen and Debra Meloy Elmegreen. **320**, 182, 110-B1 (1987)
- Molecules in Galaxies. V. CO Observations of Flocculent and Grand-Design Spirals. Antony A. Stark, Bruce G. Elmegreen, and Don Chance. **322**, 64, 138-F1 (1987)
- ELMEGREEN, DEBRA MELOY. Arm Classifications for Spiral Galaxies. Debra Meloy Elmegreen and Bruce G. Elmegreen. **314**, 3, 28-A10 (1987)
- H I Superclouds in the Inner Galaxy. Bruce G. Elmegreen and Debra

- Meloy Elmegreen. **320**, 182, 110-B1 (1987)
- ELSNER, R. F. Coherence Effects on Quasi-periodic Oscillations from Galactic X-Ray Sources. R. F. Elnser, N. Shibasaki, and M. C. Weisskopf. **320**, 527, 115-C8 (1987)
- The Effect of Decay of the Amplitude of Oscillation on Random Process Models for QPO X-Ray Stars. N. Shibasaki, R. F. Elnser, and M. C. Weisskopf. **322**, 831, 149-A1 (1987)
- ELSON, REBECCA A. W. The Structure of Young Star Clusters in the Large Magellanic Cloud. Rebecca A. W. Elson, S. Michael Fall, and Kenneth C. Freeman. **323**, 54, 153-F1 (1987)
- ELSTON, RICHARD. Optical and Near-Infrared Observations of BL Lacertae Objects and Active Quasars. Paul S. Smith, Thomas J. Balonek, Richard Elston, and Paul A. Heckert. **64**, 459, 22-G9 (1987) (Abstr. in **316**, 860, 61-E2)
- ELVIS, MARTIN. X-Ray Spectra of PG Quasars. II. The X-Ray-Ultraviolet Excess of PG 1211 + 143. Jill Bechtold, Bozena Czerny, Martin Elvis, G. Fabbiano, and Richard F. Green. **314**, 699, 37-C5 (1987)
- The Continuum of Type 1 Seyfert Galaxies. I. A Single Form Modified by the Effects of Dust. Martin Ward, Martin Elvis, G. Fabbiano, N. P. Carleton, S. P. Willner, and A. Lawrence. **315**, 74, 40-F12 (1987)
- The Continuum of Type 1 Seyfert Galaxies. II. Separating Thermal and Nonthermal Components. N. P. Carleton, Martin Elvis, G. Fabbiano, S. P. Willner, A. Lawrence, and Martin Ward. **318**, 595, 87-D6 (1987)
- Constraints on Quasar Accretion Disks from the Optical/Ultraviolet/Soft X-Ray Big Bump. Bozena Czerny and Martin Elvis. **321**, 305, 125-E5 (1987)
- Is Optical Fe II Emission Related to the Soft X-Ray Properties of Quasars? Belinda J. Wilkes, Martin Elvis, and Ian McHardy. **321**, L23, 129-C12 (1987)
- Quasar Energy Distributions. I. Soft X-Ray Spectra of Quasars. Belinda J. Wilkes and Martin Elvis. **323**, 243, 155-F5 (1987)
- ELVIUS, A. A Detailed Study of the C IV λ 1550 Line Profile and Adjacent Spectral Features in NGC 4151 from 1978 to 1983. J. Clavel, A. Altamore, A. Boksenberg, G. E. Bromage, A. Elvius, D. Pelat, M. V. Penston, G. C. Perola, M. A. J. Snijders, and M. H. Ulrich. **321**, 251, 125-A5 (1987)
- EMERSON, J. P. Near-Infrared and Optical Observations of IRAS Sources in and near Dense Cores. P. C. Myers, Gary A. Fuller, R. D. Mathieu, C. A. Beichman, P. J. Benson, R. E. Schild, and J. P. Emerson. **319**, 340, 96-F5 (1987)
- EMMERING, ROBERT T. Shocked Relativistic Magnetohydrodynamic Flows with Application to Pulsar Winds. Robert T. Emmering and Roger A. Chevalier. **321**, 334, 125-G10 (1987)
- ENGVOOLD, E. Microflares in the Solar Magnetic Network. J. G. Porter, R. L. Moore, E. J. Reichmann, E. Engvold, and K. L. Harvey. **323**, 380, 157-C5 (1987)
- EPSTEIN, RICHARD I. The X-Ray Emission from Gamma-Ray Burst Sources: Constraints on Theoretical Models. James N. Imamura and Richard I. Epstein. **313**, 711, 24-E6 (1987)
- ERICKSON, E. F. Far-Infrared Spectroscopy of Star Formation Regions in M82. P. B. Duffy, E. F. Erickson, M. R. Haas, and J. R. Houck. **315**, 68, 40-F6 (1987)
- ERICKSON, W. C. VLA Observations of the Fast Pulsar Candidate in M28. W. C. Erickson, M. J. Mahoney, R. H. Becker, and D. J. Helfand. **314**, L45, 39-B9 (1987)
- ERIGUCHI, YOSHIHARU. Fragmentation of Rapidly Rotating Gas Clouds. I. A Universal Criterion for Fragmentation. Izumi Hachisu, Joel E. Tohline, and Yoshiharu Eriguchi. **323**, 592, 161-C1 (1987)
- ERIKSSON, KJELL. Oxygen Isotopic Abundances in Evolved Stars. III. 26 Carbon Stars. Michael J. Harris, David L. Lambert, Kenneth H. Hinkle, Bengt Gustafsson, and Kjell Eriksson. **316**, 294, 53-B14 (1987)
- ERREDE, S. see SVOBODA, R. et al.
- ESHE, PAULA M. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. John D. Anderson, Timothy P. Krisher, Susan E. Borutski, Michael J. Connolly, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen. **323**, L141, 164-E1 (1987)
- ESPENAK, FRED. On the Apparent Velocity of Integrated Sunlight. I. 1983-1985. Drake Deming, Fred Espenak, Donald E. Jennings, James W. Brault, and Jeremy Wagner. **316**, 771, 60-E4 (1987)
- ESPOSITO, LARRY W. Features in Saturn's Rings. Larry W. Esposito, Craig C. Harris, and Karen E. Simmons. **63**, 749, 11-G1 (1987) (Abstr. in **313**, 931, 26-G14)
- ESTABROOK, F. B. A Search for Sinusoidal Gravitational Radiation in the Period Range 30-2000 Seconds. J. W. Armstrong, F. B. Estabrook, and H. D. Wahlquist. **318**, 536, 86-F8 (1987)
- ESTULIN, I. V. Gamma-Ray Burst Counterparts: Infrared. Bradley E. Schaefer, T. L. Cline, U. Desai, B. J. Teegarden, J.-L. Atteia, C. Barat, K. Hurley, M. Niel, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, I. V. Estulin, and A. V. Kuznetsov. **313**, 226, 17-D9 (1987)
- Short Solar Events with Evidence of Repetitive Structures. Upendra D. Desai, Chryssa Kouveliotou, C. Barat, K. Hurley, M. Niel, R. Talon, G. Vedrenne, I. V. Estulin, and V. Ch. Dolidze. **319**, 567, 99-E1 (1987)
- EVANS, A. IRAS Observations of Collisionally Heated Dust in Large Magellanic Cloud Supernova Remnants. James R. Graham, A. Evans, J. S. Albinson, M. F. Bode, and W. P. S. Meikle. **319**, 126, 94-D5 (1987)
- EVANS, CHARLES R. Degenerate Dwarf Binaries as Promising, Detectable Sources of Gravitational Radiation. Charles R. Evans, Icko Iben, Jr., and Larry Smarr. **323**, 129, 154-E1 (1987)
- EVANS, I. N. H II Region Abundances in Seyfert Galaxies. I. N. Evans and M. A. Dopita. **319**, 662, 102-B12 (1987)
- EVANS, NEAL J., II. Molecular Clouds in the Outer Galaxy. I. Far-Infrared Observations. Kathryn N. Mead, Marc L. Kutner, Neal J. Evans II, Paul M. Harvey, and Bruce A. Wilking. **312**, 321, 4-D4 (1987)
- Submillimeter Spectral Line Observations in Very Dense Regions. Neal J. Evans II, Lee G. Mundy, John H. Davis, and Paul Vanden Bout. **312**, 344, 4-E13 (1987)
- Models of Molecular Cloud Cores. III. A Multitransition Study of H₂CO. Lee G. Mundy, Neal J. Evans II, Ronald L. Snell, and Paul F. Goldsmith. **318**, 392, 83-B11 (1987)
- Observations of Infrared Emission Lines and Radio Continuum Emission from Pre-Main-Sequence Objects. Neal J. Evans II, Russell M. Leveque, S. Beckwith, and Mike Skrutskie. **320**, 364, 112-A9 (1987)
- The Interstellar Clouds toward 3C 154 and 3C 353. S. R. Federman, Neal J. Evans II, R. F. Willson, E. Falgarone, F. Combes, and B. M. Scheefe. **322**, 960, 150-D4 (1987)
- VLA Observations of H₂CO in Absorption against the Cosmic Background Radiation: Clumps in the S140 Molecular Cloud. Neal J. Evans II, Marc L. Kutner, and Lee G. Mundy. **323**, 145, 154-F3 (1987)
- EVANS, ROBERT. The Supernova Rate in Shapley-Ames Galaxies. Sidney van den Bergh, Robert D. McClure, and Robert Evans. **323**, 44, 153-E4 (1987)
- EVANS, W. D. Gamma-Ray Burster Counterparts: Infrared. Bradley E. Schaefer, T. L. Cline, U. Desai, B. J. Teegarden, J.-L. Atteia, C. Barat, K. Hurley, M. Niel, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, I. V. Estulin, and A. V. Kuznetsov. **313**, 226, 17-D9 (1987)
- EVENSON, P. A. Magnetic Helicity of the Parker Field. J. W. Bieber, P. A. Evenson, and W. H. Matthaeus. **315**, 700, 48-C7 (1987)
- EVERSON, JOHN. A Variational Principle for Determining the Oscillations and Stability of Stellar Systems. John Everson. **314**, 47, 28-E1 (1987)
- EVJATAR, A. Planetary Fast Neutral Emission and Effects on the Solar Wind: A Cometary Exosphere Analog: Erratum. D. D. Barbosa and A. Evjatar. **321**, 1049, 136-A1 (1987) (Orig. paper in **310**, 927, 144-B10)
- EVJARD, AUGUST E. Large-Scale Clustering of Galaxies with Massive Dark Halos. II. Mass-to-Light Profiles and Dynamical Mass Estimates of Galaxy Groups. August E. Evjard. **316**, 36, 50-D6 (1987)
- FABBIANO, G. A Statistical Analysis of the Einstein Normal Galaxy Sample. III. Radio and X-Ray Properties of Elliptical and S0 Galaxies. G. Fabbiano, U. Klein, G. Trinchieri, and R. Wielebinski. **312**, 111, 2-C1 (1987)
- X-Ray Spectra of PG Quasars. II. The X-Ray-Ultraviolet Excess of PG 1211 + 143. Jill Bechtold, Bozena Czerny, Martin Elvis, G. Fabbiano, and Richard F. Green. **314**, 699, 37-C5 (1987)
- X-Ray Observations of Spiral Galaxies. II. Images and Spectral Parameters of 13 Galaxies. G. Fabbiano and G. Trinchieri. **315**, 46, 40-D11 (1987)
- The Continuum of Type 1 Seyfert Galaxies. I. A Single Form Modified by the Effects of Dust. Martin Ward, Martin Elvis, G. Fabbiano, N. P. Carleton, S. P. Willner, and A. Lawrence. **315**, 74, 40-F12 (1987)
- The X-Ray Spectral Properties of the Bulge of M31. G. Fabbiano, G. Trinchieri, and L. S. Van Speybroeck. **316**, 127, 51-D1 (1987)
- The Continuum of Type 1 Seyfert Galaxies. II. Separating Thermal and Nonthermal Components. N. P. Carleton, Martin Elvis, G. Fabbiano, S. P. Willner, A. Lawrence, and Martin Ward. **318**, 595, 87-D6 (1987)
- FABBIANO, GIUSEPPINA. Properties of the X-Ray Emitting Gas in Early-Type Galaxies. Claude R. Canizares, Giuseppina Fabbiano, and Ginevra Trinchieri. **312**, 503, 8-D5 (1987)
- Radio Continuum Observations of Early- and Late-Type Spiral Galaxies. Isabella M. Gioia and Giuseppina Fabbiano. **63**, 771, 13-A13 (1987) (Abstr. in **314**, 831, 38-F7)
- FABBRI, R. Multipole Anisotropies of the Cosmic Background Radiation

- and Inflationary Models. *R. Fabbri, F. Lucchin, and S. Matarrese.* **315**, 1, 40-A7 (1987)
- The Large-Scale Anisotropies of the Extragalactic Infrared Background. *R. Fabbri, P. Andreani, F. Melchiorri, and B. Nisini.* **315**, 12, 40-B4 (1987)
- FABER, S. M. Spectroscopy and Photometry of Elliptical Galaxies. I. New Distance Estimator. *Alan Dressler, Donald Lynden-Bell, David Burstein, Roger L. Davies, S. M. Faber, Roberto Terlevich, and Gary Wegner.* **313**, 42, 15-D7 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies: A Large-Scale Streaming Motion in the Local Universe. *Alan Dressler, S. M. Faber, David Burstein, Roger L. Davies, Donald Lynden-Bell, R. J. Terlevich, and Gary Wegner.* **313**, L37, 27-A9 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies. II. The Spectroscopic Parameters. *Roger L. Davies, David Burstein, Alan Dressler, S. M. Faber, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner.* **64**, 581, 26-B1 (1987) (Abstr. in **318**, 944, 91-C9)
- Spectroscopy and Photometry of Elliptical Galaxies. III. *UBV* Aperture Photometry, CCD Photometry, and Magnitude-related Parameters. *David Burstein, Roger L. Davies, Alan Dressler, S. M. Faber, Remington P. S. Stone, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner.* **64**, 601, 26-C7 (1987) (Abstr. in **318**, 944, 91-C9)
- FAGUNDES, H. V. A Search for QSOs to Fit a Cosmological Model with Flat, Closed Spatial Sections. *H. V. Fagundes and U. F. Wichoski.* **322**, L5, 145-A8 (1987)
- FAHEY, A. J. ^{16}O Excesses in Murchison and Murray Hibonites: A Case Against a Late Supernova Injection Origin of Isotopic Anomalies in O, Mg, Ca, and Ti. *A. J. Fahey, J. N. Goswami, K. D. McKeegan, and E. K. Zinner.* **323**, L91, 158-G5 (1987)
- FAHEY, R. P. The Problem of V444 Cygni. *A. B. Underhill and R. P. Fahey.* **313**, 358, 18-G9 (1987)
- FAHLMAN, G. G. Discovery of High-Degree Nonradial Oscillations in Rapidly Rotating δ Scuti Stars? *G. A. H. Walker, S. Yang, and G. G. Fahlgman.* **320**, L139, 121-E9 (1987)
- FAHLMAN, GREGORY G. Deep CCD Photometry in Globular Clusters. V. *M. S. Harvey, B. Richer, and Gregory G. Fahlgman.* **316**, 189, 52-A13 (1987)
- FALGARONE, E. The Interstellar Clouds toward 3C 154 and 3C 353. *S. R. Federman, Neal J. Evans II, R. F. Willson, E. Falgarone, F. Combes, and B. M. Scheufele.* **322**, 960, 150-D4 (1987)
- FALL, S. MICHAEL. The Structure of Young Star Clusters in the Large Magellanic Cloud. *Rebecca A. W. Elson, S. Michael Fall, and Kenneth C. Freeman.* **323**, 54, 153-F1 (1987)
- FALOMO, R. The Redshift of the BL Lacertae Object PKS 2005-489. *R. Falomo, L. Maraschi, E. G. Tanzi, and A. Treves.* **318**, L39, 92-B1 (1987)
- FANELLI, MICHAEL N. Spectral Synthesis in the Ultraviolet. I. Far-Ultraviolet Stellar Library. *Michael N. Fanelli, Robert W. O'Connell, and Trinh X. Thuan.* **321**, 768, 133-A1 (1987)
- FAZIO, G. G. Structure in the Nucleus of NGC 1068 at 10 Microns. *R. Tresch-Fienberg, G. G. Fazio, D. Y. Gezari, W. F. Hoffmann, G. M. Lamb, P. K. Shu, and C. R. McCreight.* **312**, 542, 8-G2 (1987)
- FEDERMAN, S. R. The CO $J = 2 \rightarrow 1$ Emission from the Interstellar Gas toward Zeta Ophiuchi. *R. M. Crutcher and S. R. Federman.* **316**, L71, 62-C2 (1987)
- The H I Distribution in Clouds within Galaxies. *E. J. Shaya and S. R. Federman.* **319**, 76, 93-G9 (1987)
- The Interstellar Clouds toward 3C 154 and 3C 353. *S. R. Federman, Neal J. Evans II, R. F. Willson, E. Falgarone, F. Combes, and B. M. Scheufele.* **322**, 960, 150-D4 (1987)
- FEIBELMAN, WALTER A. The (C III $\lambda 1909/\text{Si III } \lambda 1892$) Ratio as a Diagnostic for Planetary Nebulae and Symbiotic Stars. *Walter A. Feibelman and Lawrence H. Aller.* **319**, 407, 97-E11 (1987)
- FEIGELSON, E. D. X-Rays from the Radio Halo of M87. *E. D. Feigelson, P. A. D. Wood, E. J. Schreier, D. E. Harris, and M. J. Reid.* **312**, 101, 2-B5 (1987)
- FEIGELSON, ERIC D. Evidence of an Infrared Luminosity Indicator for Galaxies. *Eric D. Feigelson, Takashi Isoe, and Daniel W. Weedman.* **319**, L51, 107-C4 (1987)
- FEJES, ISTVÁN. The Inner Beams of SS 433. *Jonathan D. Romney, Richard T. Schilizzi, István Fejes, and Ralph E. Spencer.* **321**, 822, 133-E3 (1987)
- FEKEL, FRANCIS C., JR. The Dependence of Ultraviolet Chromospheric Emission upon Rotation among Late-Type Stars. *Theodore Simon and Francis C. Fekel, Jr.* **316**, 434, 54-G2 (1987)
- FELDMAN, P. A. Upper Limits to Interstellar PO. *H. E. Matthews, P. A. Feldman, and P. F. Bernath.* **312**, 358, 4-F14 (1987)
- Evidence from Meteor Patrol Photographs for a Nonastronomical Origin of the Reported Optical Flashes in Perseus. *I. Halliday, P. A. Feldman, and A. T. Blackwell.* **320**, L153, 121-F11 (1987)
- FELDMAN, P. D. Detection of Neutral Oxygen and Sulfur Emissions near
- to Using IUE. *G. E. Ballester, H. W. Moos, P. D. Feldman, D. F. Strobel, M. E. Summers, J.-L. Bertaux, T. E. Skinner, M. C. Festou, and J. H. Lieske.* **319**, L33, 100-D1 (1987)
- FELDMAN, U. The Temperature of Solar Flares Determined from X-Ray Spectral Line Ratios. *G. A. Doschek and U. Feldman.* **313**, 883, 26-D7 (1987)
- Ultraviolet Al III Emission Lines and the Physics of the Solar Transition Region. *G. A. Doschek and U. Feldman.* **315**, L67, 45-F5 (1987)
- Observation of Nonthermal Energy Distributions during the Impulsive Phase of Solar Flares. *J. F. Seely, U. Feldman, and G. A. Doschek.* **319**, 541, 99-B9 (1987)
- On the Unresolved Fine Structures of the Solar Atmosphere. II. The Temperature Region 2×10^5 K– 5×10^5 K. *U. Feldman.* **320**, 426, 112-F2 (1987)
- FELLI, M. Solar System-Sized Condensations in the Orion Nebula. *E. Churchwell, M. Felli, D. O. S. Wood, and M. Massi.* **321**, 516, 127-F11 (1987)
- FENIMORE, E. E. Gamma-Ray Burster Counterparts: Infrared. *Bradley E. Schaefer, T. L. Cline, U. Desai, B. J. Teegarden, J.-L. Atteia, C. Barat, K. Hurley, M. Niel, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, I. V. Estulin, and A. V. Kuznetsov.* **313**, 226, 17-D9 (1987)
- Spartan 1 X-Ray Observations of the Perseus Cluster: Comparison of the Iron Abundances and Temperatures in the Inner and Outer Regions of the Cluster. *M. P. Ulmer, R. G. Cruddace, E. E. Fenimore, G. G. Fritz, and W. A. Snyder.* **319**, 118, 94-C11 (1987)
- Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. *J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Koweliotou, T. Cline, B. Dennis, U. Desai, and L. Orwig.* **320**, L105, 121-C7 (1987)
- A New Type of Repetitive Behavior in a High-Energy Transient. *J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Koweliotou, T. L. Cline, B. R. Dennis, U. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov.* **320**, L111, 121-C13 (1987)
- SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806 – 20. *C. Koweliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov.* **322**, L21, 145-B8 (1987)
- FERGUSON, DONALD H. BE Ursae Majoris: A Detached Binary with a Unique Reprocessing Spectrum. *Donald H. Ferguson, James Liebert, Roc Cutri, Richard F. Green, S. P. Willner, João E. Steiner, and Susan Tokarz.* **316**, 399, 54-D4 (1987)
- FERLAND, G. J. Photoexcitation of Nuclei in Quasar Emission-Line Regions. *R. N. Boyd and G. J. Ferland.* **318**, L21, 85-B8 (1987)
- FERLAND, GARY J. The Ultraviolet and Optical Emission-Line Spectrum of III Zw 77. *Gary J. Ferland and Donald E. Osterbrock.* **318**, 145, 80-E3 (1987)
- What Heats the Hot Phase in Active Nuclei? *William G. Mathews and Gary J. Ferland.* **323**, 456, 159-E6 (1987)
- FERNANDEZ-CASTRO, TELMO. Spectroscopic Observations of the Symbiotic Binary RW Hydrae. *Scott J. Kenyon and Telmo Fernandez-Castro.* **316**, 427, 54-F9 (1987)
- FERRARI, A. Current-driven Magnetohydrodynamic Thermal Instabilities in Sheared Fields. *G. Bodo, A. Ferrari, S. Massaglia, and R. Rosner.* **313**, 432, 19-F10 (1987)
- FERRINI, FEDERICO. The Effects of Stimulated Star Formation on the Evolution of the Galaxy. III. The Chemical Evolution of Nonlinear Systems. *Steven N. Shore, Federico Ferrini, and Francesco Palla.* **316**, 663, 59-C14 (1987)
- FESEN, ROBERT A. Discovery of Fast-moving Nitrogen-rich Ejecta in the Supernova Remnant Cassiopeia A. *Robert A. Fesen, Robert H. Becker, and William P. Blair.* **313**, 378, 19-B3 (1987)
- FESTOU, M. C. Detection of Neutral Oxygen and Sulfur Emissions near to Using IUE. *G. E. Ballester, H. W. Moos, P. D. Feldman, D. F. Strobel, M. E. Summers, J.-L. Bertaux, T. E. Skinner, M. C. Festou, and J. H. Lieske.* **319**, L33, 100-D1 (1987)
- FEY, ALAN L. VLA and Low-Frequency VLBI Observations of the Radio Source 0503 + 467: Austere Constraints on Interstellar Scattering in Two Media. *Steven R. Spangler, Alan L. Fey, and James M. Cordes.* **322**, 909, 149-G3 (1987)
- FICHTEL, C. E. Reexamination of the SAS 2 Cygnus X-3 Data. *C. E. Fichtel, D. J. Thompson, and R. C. Lamb.* **319**, 362, 97-A9 (1987)
- FICK, B. E. Sporadic and Periodic 10–1000 TeV Gamma Rays From Cygnus X-3. *R. M. Baltrusaitis, G. L. Cassiday, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebing, C. P. Ling, E. C. Loh, P. Sokolsky, P. Sommers, and D.*

- Steck. 323, 685, 162-C1 (1987)
- FIEDLER, R. Evidence for Refractive Scintillation of Two Extragalactic Sources Seen through the Galactic Disk. *Brian Dennison, R. Fiedler, K. J. Johnston, J. H. Spencer, E. B. Waltman, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. 313, 141, 16-E5 (1987)
- FIEDLER, R. L. Daily Observations of Compact Extragalactic Radio Sources at 2695 and 8085 MHz, 1979-1985. *R. L. Fiedler, E. B. Waltman, J. H. Spencer, K. J. Johnston, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. 65, 319, 33-A5 (1987) (Abstr. in 321, 1050, 136-A1)
- FIELD, G. B. Is Solar Neutrino Capture Rate Correlated with Sunspot Number? *J. N. Bahcall, G. B. Field, and W. H. Press*. 320, L69, 114-F1 (1987)
- FINK, H. X-Ray Observations of Solar Flares with the Einstein Observatory. *J. H. M. M. Schmitt, F. R. Harnden, Jr., and H. Fink*. 322, 1023, 151-B6 (1987)
- FINKENTHAL, M. A Comparison of the C III, O V, F VI, and Ne VII $\Delta\lambda = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. *M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengston, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan*. 313, 920, 26-G3 (1987)
- Laboratory Study of the Spectrum of Highly Ionized Calcium in the 100-250 Å Range Applied to Solar Flare Diagnostics. *S. Lippmann, M. Finkenthal, L. K. Huang, H. W. Moos, B. C. Stratton, T. L. Yu, A. K. Bhatia, and W. L. Hodge*. 316, 819, 61-A11 (1987)
- FINKENZELLER, ULRICH. The Atmospheres of T Tauri Stars. I. High-Resolution Calibrated Observations of Moderately Active Stars. *Ulrich Finkenzeller and Gabor Basri*. 318, 823, 90-A2 (1987)
- FISCHER, J. Infrared Line Observations of Low-Luminosity Outflow Sources. *Howard A. Smith, J. Fischer, T. R. Geballe, and P. R. Schwartz*. 316, 265, 52-G12 (1987)
- Molecular Hydrogen Line Emission in Seyfert Galactic Nuclei. *J. Fischer, T. R. Geballe, Howard A. Smith, M. Simon, and J. W. V. Storey*. 320, 667, 117-B2 (1987)
- FISHER, GEORGE H. Explosive Evaporation in Solar Flares. *George H. Fisher*. 317, 502, 69-D6 (1987)
- FITCHETT, MICHAEL. Substructure in the Coma Cluster. *Michael Fitchett and Rachel Webster*. 317, 653, 73-C1 (1987)
- FIX, JOHN D. Infrared Spectroscopy of IRC + 10420. *John D. Fix and Michael L. Cobb*. 312, 290, 4-B1 (1987)
- Infrared Speckle Interferometry and Imaging of Several OH/IR Stars. *Michael L. Cobb and John D. Fix*. 315, 323, 43-D10 (1987)
- The Distribution of Maser Emission in OH/IR Stars. *Alan D. Welty, John D. Fix, and Robert L. Mutel*. 318, 852, 90-C10 (1987)
- A Radio Search for Crab-like Nebulae in M33. *Stephen P. Reynolds and John D. Fix*. 322, 673, 147-B7 (1987)
- FLECK, ROBERT C. Jr. Angular Momentum in a Turbulent Interstellar Medium. *Robert C. Fleck, Jr.* 315, 259, 42-F14 (1987)
- FLEMING, THOMAS A. A Search for Pulsating Stars Similar to PG 1159 - 035 and K1-16. *Albert D. Grauer, Howard E. Bond, James Liebert, Thomas A. Fleming, and Richard F. Green*. 323, 271, 156-A10 (1987)
- FLORKOWSKI, D. R. Evidence for Refractive Scintillation of Two Extragalactic Sources Seen through the Galactic Disk. *Brian Dennison, R. Fiedler, K. J. Johnston, J. H. Spencer, E. B. Waltman, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. 313, 141, 16-E5 (1987)
- Daily Observations of Compact Extragalactic Radio Sources at 2695 and 8085 MHz, 1979-1985. *R. L. Fiedler, E. B. Waltman, J. H. Spencer, K. J. Johnston, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. 65, 319, 33-A5 (1987) (Abstr. in 321, 1050, 136-A1)
- FLÜCKIGER, E. Solar Neutron Emissivity During the Large Flare on 1982 June 3. *E. L. Chupp, H. Debrunner, E. Flückiger, D. J. Forrest, F. Golliez, G. Kanbach, W. T. Vestrand, J. Cooper, and G. Share*. 318, 913, 91-A1 (1987)
- FOLTZ, CRAIG B. Molecules at Early Epochs. II. H₂ and CO toward PHL 957. *John H. Black, Frederic H. Chaffee, Jr., and Craig B. Foltz*. 317, 442, 68-G2 (1987)
- The Complex Absorption Spectrum of the Broad Absorption Line QSO 1303 + 308. *Craig B. Foltz, Ray J. Weymann, Simon L. Morris, and David A. Turnshek*. 317, 450, 68-G10 (1987)
- FOMALONT, E. High-Resolution Observations of CO from the Bipolar Nebula CRL 2688. *R. Kawabe, M. Ishiguro, T. Kasuga, K.-I. Morita, N. Ukita, H. Kobayashi, S. Okumura, E. Fomalont, and N. Kaifu*. 314, 322, 31-F1 (1987)
- FONTAINE, G. An Independent Method for Determining the Age of the Universe. *D. E. Winget, C. J. Hansen, James Liebert, H. M. Van Horn, G. Fontaine, R. E. Nather, S. O. Kepler, and D. Q. Lamb*. 315, L77, 49-B1 (1987)
- Studies of Hot B Subdwarfs. V. Continuing Investigation of the C, N, and Si Abundance Patterns in the Atmospheres of sdB Stars. *R. Lamontagne, F. Wesemael, and G. Fontaine*. 318, 844, 90-C1 (1987)
- Selective Mass Loss, Abundance Anomalies, and Helium-rich Stars. *G. Michaud, J. Dupuis, G. Fontaine, and T. Montmerle*. 322, 302, 141-B7 (1987)
- FORBES, T. G. Evidence for Gentle Chromospheric Evaporation during the Gradual Phase of Large Solar Flares. *B. Schmieder, T. G. Forbes, J. M. Malherbe, and M. E. Machado*. 317, 956, 76-E8 (1987)
- FORD, HOLLAND C. New Evolutionary Relationships for Magellanic Cloud Planetary Nebulae. *Michael A. Dopita, Stephen J. Meatheringham, Peter R. Wood, B. Louise Webster, David H. Morgan, and Holland C. Ford*. 315, L107, 49-D2 (1987)
- Dynamics of the Outer Disk and Halo of M31. *Richard Nolthenius and Holland C. Ford*. 317, 62, 64-E13 (1987)
- The Spatial Distribution and Population of Novae in M31. *Robin Ciardullo, Holland C. Ford, James D. Neill, George H. Jacoby, and Allen W. Shafter*. 318, 520, 86-E6 (1987)
- FORD, W. KENT, JR. The Structure and Evolution of Hoag's Object. *François Schweizer, W. Kent Ford, Jr., Robert Jedrzejewski, and Riccardo Giovanelli*. 320, 454, 114-D3 (1987)
- FORREST, D. J. Solar Neutron Emissivity During the Large Flare on 1982 June 3. *E. L. Chupp, H. Debrunner, E. Flückiger, D. J. Forrest, F. Golliez, G. Kanbach, W. T. Vestrand, J. Cooper, and G. Share*. 318, 913, 91-A1 (1987)
- Gamma-Ray Observations of the Crab Region Using a Coded-Aperture Telescope. *M. L. McConnell, P. P. Dunphy, D. J. Forrest, E. L. Chupp, and A. Owens*. 321, 543, 128-A13 (1987)
- The Directivity of High-Energy Emission from Solar Flares. II. *Solar Maximum Mission Observations*. *W. Thomas Vestrand, D. J. Forrest, E. L. Chupp, E. Rieger, and G. H. Share*. 322, 1010, 151-A7 (1987)
- FORREST, W. J. Direct Infrared Imaging of VB 8. *M. F. Skrutskie, W. J. Forrest, and M. A. Shore*. 312, L55, 14-C11 (1987)
- FOSTER, G. W. see SVOBODA, R. et al.
- FOWLER, J. R. The Local Interstellar Medium. VII. The Local Interstellar Wind and Interstellar Material in Front of the Nearby Star α Ophiuchi. *P. C. Frisch, D. G. York, and J. R. Fowler*. 320, 842, 119-A10 (1987)
- FOWLER, P. H. Ariel 6 Measurements of the Fluxes of Ultraheavy Cosmic Rays. *P. H. Fowler, R. N. F. Walker, M. R. W. Mashed, R. T. Moses, A. Worley, and A. M. Gay*. 314, 739, 37-F7 (1987)
- FOWLER, WILLIAM A. Gamma-Ray Constraints on ²²Na Yields in Nova Explosions. *J. C. Higdon and William A. Fowler*. 317, 710, 73-G2 (1987)
- FRANCESCHINI, A. Interpretation of Deep Counts of Radio Sources. *L. Danese, G. De Zotti, A. Franceschini, and L. Toffolatti*. 318, L15, 85-B2 (1987)
- FRANK, J. Polarized Radiation from Extended Magnetic Polar Caps. *G. Channugam and J. Frank*. 320, 746, 118-A1 (1987)
- FRANSSON, C. Late Emission from SN 1987A. *C. Fransson and R. A. Chevalier*. 322, L15, 145-B2 (1987)
- FRAQUELLI, DOROTHY A. RICHFLD Photometry of NGC 6723. *Donald H. Martins and Dorothy A. Fraquelli*. 65, 83, 28-G2 (1987) (Abstr. in 319, 1012, 106-A10)
- FREEMAN, K. C. NGC 5266: An Elliptical Galaxy with a Dust Ring. *S. R. Varnas, F. Bertola, G. Galletta, K. C. Freeman, and D. Carter*. 313, 69, 15-F12 (1987)
- FREEMAN, KENNETH C. The Structure of Young Star Clusters in the Large Magellanic Cloud. *Rebecca A. W. Elson, S. Michael Fall, and Kenneth C. Freeman*. 323, 54, 153-F1 (1987)
- FREHLICH, R. G. Refractive Scintillation in the Interstellar Medium. *W. A. Coles, R. G. Frehlich, B. J. Rickett, and J. L. Codona*. 315, 666, 48-A1 (1987)
- FREIRE FERRERO, R. On the Line Emission Profile and Line Source Function in the Case of Partial Redistribution. *R. Freire Ferrero*. 314, 822, 38-E8 (1987)
- FRENK, CARLOS S. Clusters, Filaments, and Voids in a Universe Dominated by Cold Dark Matter. *Simon D. M. White, Carlos S. Frenk, Marc Davis, and George Efstathiou*. 313, 505, 22-C11 (1987)
- FRERKING, MARGARET A. The Structure and Dynamics of Bok Globule B335. *Margaret A. Frerking, William D. Langer, and Robert W. Wilson*. 313, 320, 18-D10 (1987)
- FRIBERG, P. Observations of SiO toward OMC-1: A New Outflow Source 1.75 South of Orion-KL? *L. M. Ziurys and P. Friberg*. 314, L49, 39-B12 (1987)
- Observations of OCS and a Search for OC₃S in the Interstellar Medium. *H. E. Matthews, J. M. MacLeod, N. W. Broten, S. C. Madden, and P. Friberg*. 315, 646, 47-F7 (1987)
- FRIEDJUNG, M. First Unambiguous X-Ray Detection of R Aquarii. *R. Viotti, L. Piro, M. Friedjung, and A. Cassatella*. 319, L7, 100-A10

- (1987)
- FRIEDMAN, JOHN L. On the Maximum Mass of a Uniformly Rotating Neutron Star. *John L. Friedman and James R. Ipser*. **314**, 594, 36-A13 (1987)
- FRIEND, D. B. Winds from Rotating, Magnetic, Hot Stars. III. The Azimuthal Velocity and Magnetic Force. *K. B. MacGregor and D. B. Friend*. **312**, 659, 10-B6 (1987)
- FRISCH, P. C. The Local Interstellar Medium. VII. The Local Interstellar Wind and Interstellar Material in Front of the Nearby Star α Ophiuchi. *P. C. Frisch, D. G. York, and J. R. Fowler*. **320**, 842, 119-A10 (1987)
- FRISCH, PRISCILLA C. Radial Velocities in Selected B-G Stars. *Priscilla C. Frisch*. **65**, 313, 32-E9 (1987) (Abstr. in **320**, 937, 120-B2)
- FRITZ, G. G. Spartan 1 X-Ray Observations of the Perseus Cluster: Comparison of the Iron Abundances and Temperatures in the Inner and Outer Regions of the Cluster. *M. P. Ulmer, R. G. Cruddace, E. E. Fenimore, G. G. Fritz, and W. A. Snyder*. **319**, 118, 94-C11 (1987)
- FROGEL, JAY A. IRAS 00521 - 7054: An Unusually Warm Galaxy. *Jay A. Frogel and J. H. Elias*. **313**, L53, 27-B10 (1987)
- Infrared Photometry and Spectroscopy of Supernova 1986g in NGC 5128-Centaurus A. *Jay A. Frogel, Brooke Gregory, Kimiaki Kawara, Dave Laney, M. M. Phillips, Don Terndrup, Frederick Vrba, and Albert E. Whitford*. **315**, L129, 49-E11 (1987)
- M Giants in Baade's Window: Infrared Colors, Luminosities, and Implications for the Stellar Content of E and S0 Galaxies. *Jay A. Frogel and A. E. Whitford*. **320**, 199, 110-C10 (1987)
- FROMMHOFF, LOTHAR. Collision-induced Rototranslational Absorption Spectra of CH_4 - CH_4 Pairs at Temperatures from 50 to 300 K. *Aleksandra Borysow and Lothar Frommhold*. **318**, 940, 91-C2 (1987)
- Collision-induced Rototranslational Absorption Spectra of N_2 - N_2 Pairs for Temperatures from 50 to 300 K: Erratum. *Aleksandra Borysow and Lothar Frommhold*. **320**, 437, 112-G4 (1987) (Orig. paper in **311**, 1043, 160-C6)
- FRONTERA, F. Time Variability of Gamma Cassiopeiae in X-Rays. *F. Frontera, D. Dal Fiume, N. R. Robba, G. Manzo, S. Re, and E. Costa*. **320**, L127, 121-D13 (1987)
- FRYXELL, B. A. Numerical Simulations of Adiabatic Axisymmetric Accretion Flow. I. A New Mechanism for the Formation of Jets. *B. A. Fryxell, Ronald E. Taam, and S. L. W. McMillan*. **315**, 536, 46-E5 (1987)
- FU, ALBERT. The Thermodynamics of Anisotropic Radiating Systems. *Albert Fu*. **323**, 211, 155-D1 (1987)
- Physical Constraints on Variable Eddington Factors for the Gray Problem in Radiative Transfer. *Albert Fu*. **323**, 227, 155-E3 (1987)
- FUJIMOTO, MASAYUKI Y. Thermal Evolution of Accreting Neutron Stars. II. Long X-Ray Bursts as a Probe Into the Interior. *Masayuki Y. Fujimoto, Tomoyuki Hanawa, Ikko Iben, Jr., and Martin B. Richardson*. **315**, 198, 42-B9 (1987)
- On the Theory of Type I X-Ray Bursts. The Energetics of Bursts and the Nuclear Fuel Reservoir in the Envelope. *Masayuki Y. Fujimoto, Mirek Sztajno, Walter H. G. Lewin, and Jan van Paradijs*. **319**, 902, 104-G5 (1987)
- FUJIMOTO, MITSUAKI. A Shocked-Jet Model of the Galactic Center Bridge and the Radio Arc. *Yoshiaki Sofue and Mitsuaki Fujimoto*. **319**, L73, 107-D11 (1987)
- FULLER, G. M. The Quark-Hadron Phase Transition and Primordial Nucleosynthesis. *C. A. Alcock, G. M. Fuller, and G. J. Mathews*. **320**, 439, 114-C1 (1987)
- Resonant Neutrino Oscillations and Stellar Collapse. *G. M. Fuller, R. W. Mayle, J. R. Wilson, and D. N. Schramm*. **322**, 795, 148-E3 (1987)
- FULLER, GARY A. Near-Infrared and Optical Observations of IRAS Sources in and near Dense Cores. *P. C. Myers, Gary A. Fuller, R. D. Mathieu, C. A. Beichman, P. J. Benson, R. E. Schild, and J. P. Emerson*. **319**, 340, 96-F5 (1987)
- FULLERTON, ALEXANDER W. The Nonradial Oscillations of ϵ Persei. II. Nonlinear Characteristics. *Myron A. Smith, Alexander W. Fullerton, and John R. Percy*. **320**, 768, 118-B10 (1987)
- FURENLID, INGEMAR. Spectroscopy of the Optical Photosphere of the Hot Pulsating Star BW Vulpeculae. *Ingemar Furenlid, Arthur Young, Thomas Meylan, Chester Haag, and Greg Crinklaw*. **319**, 264, 95-G9 (1987)
- FUSHIKI, IKKO. S-Matrix Calculation of the Triple-Alpha Reaction. *Ikko Fushiki and D. Q. Lamb*. **317**, 368, 68-A1 (1987)
- New Insights from a Global View of X-Ray Bursts. *Ikko Fushiki and D. Q. Lamb*. **323**, L55, 158-D10 (1987)
- GABUZDA, D. C. Linear Polarization Structure of the BL Lacertae Object OJ 287 at Milliarcsecond Resolution. *D. H. Roberts, D. C. Gabuzda, and J. F. C. Wardle*. **323**, 536, 160-E5 (1987)
- GAETZ, T. J. Gasdynamical Stripping of Elliptical Galaxies. *T. J. Gaetz, E. E. Salpeter, and G. Shaviv*. **316**, 530, 57-G3 (1987)
- GAJEWSKI, W. see SVOBODA, R. et al.
- GALLETTA, G. NGC 5266: An Elliptical Galaxy with a Dust Ring. *S. R. Varnas, F. Bertola, G. Galletta, K. C. Freeman, and D. Carter*. **313**, 69, 15-F12 (1987)
- Detection of Retrograde Gas Streaming in the SBO Galaxy NGC 4546. *G. Galletta*. **318**, 531, 86-F3 (1987)
- GANAZER, K. S. see SVOBODA, R. et al.
- GARAY, GUIDO. Compact Continuum Radio Sources in the Orion Nebula. *Guido Garay, James M. Moran, and Mark J. Reid*. **314**, 535, 35-D2 (1987)
- GARCIA, MICHAEL R. Discovery of an X-Ray Burst from 4U 2129 + 47. *Michael R. Garcia and Jonathan E. Grindlay*. **313**, L59, 27-C1 (1987)
- GARCIA-MUNOZ, M. Cosmic Ray Propagation in the Galaxy and in the Heliosphere: The Path-Length Distribution at Low Energy. *M. Garcia-Munoz, J. A. Simpson, T. G. Guzik, J. P. Wefel, and S. H. Margolis*. **64**, 269, 19-F6 (1987) (Abstr. in **315**, 733, 48-E14)
- GARDEN, RON. Detection of Vibration-Rotation Band Lines of Shocked CO in Orion. *T. R. Geballe and Ron Garden*. **317**, L107, 78-E9 (1987)
- Fluorescent Molecular Hydrogen Emission from the Reflection Nebula NGC 2023. *Ian Gatley, Tetsuo Hasegawa, Hiroko Suzuki, Ron Garden, Peter Brand, John Lightfoot, William Glencross, Haruyuki Okuda, and Tetsuya Nagata*. **318**, L73, 92-D4 (1987)
- GARDEN, RON P. Level Population and Para/Ortho Ratio of Fluorescent H_2 in NGC 2023. *Tetsuo Hasegawa, Ian Gatley, Ron P. Garden, Peter W. J. L. Brand, Masatoshi Ohishi, Masahiko Hayashi, and Norio Kaifu*. **318**, L77, 92-D12 (1987)
- GARDNER, F. F. Widespread Strong Methanol Masers near H II Regions. *R. P. Norris, J. L. Caswell, F. F. Gardner, and K. J. Wellington*. **321**, L159, 137-E8 (1987)
- GARILLI, B. X-Ray and Optical Observations of X-Ray-Selected BL Lacertae Objects. *P. Giommi, P. Barr, B. Garilli, I. M. Gioia, T. Maccacaro, D. Maccagni, and R. E. Schild*. **322**, 662, 146-A10 (1987)
- GARMIRE, G. P. Observations of Soft X-Ray Spectra from a Seyfert 1 and a Narrow Emission-Line Galaxy: Erratum. *K. P. Singh, G. P. Garmire, and J. Nousek*. **312**, 484, 6-B10 (1987) (Orig. paper in **297**, 633, 108-D10)
- A 9 Month Long Soft X-Ray Survey of the Large Magellanic Cloud. I. X-Ray Map at 1/4 keV. *K. P. Singh, J. A. Nousek, D. N. Burrows, and G. P. Garmire*. **313**, 185, 17-A7 (1987)
- GARNAVICH, PETER M. On the Distribution of Colors for Stars in the Ninth to Fifteenth Magnitude Range: Statistics and Implications for Galactic Structure. *Barry M. Lasker, Peter M. Garnavich, and Anne P. Reynolds*. **320**, 502, 115-A3 (1987)
- GARNETT, D. R. The Composition Gradient across M81. *D. R. Garnett and G. A. Shields*. **317**, 82, 64-G7 (1987)
- The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. *R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Leveault*. **317**, 355, 67-F14 (1987)
- GARRISON, R. F. The Early A Type Stars: Refined MK Classification, Confrontation with Strömgren Photometry, and the Effects of Rotation. *R. O. Gray and R. F. Garrison*. **65**, 581, 37-C1 (1987) (Abstr. in **322**, 1076, 151-G2)
- GARWOOD, ROBERT W. Arcabic Observations of IRAS Galaxies at 21 and 18 Centimeters Wavelengths. *Robert W. Garwood, George Helou, and John M. Dickey*. **322**, 88, 138-G11 (1987)
- GARY, DALE E. Multifrequency Observations of a Solar Active Region during a Partial Eclipse. *Dale E. Gary and G. J. Hurford*. **317**, 522, 69-E12 (1987)
- GARY, G. A. Nonpotential Features Observed in the Magnetic Field of an Active Region. *G. A. Gary, R. L. Moore, M. J. Hagyard, and Bernhard M. Haisch*. **314**, 782, 38-B8 (1987)
- GASKELL, C. MARTIN. The Accuracy of Cross-Correlation Estimates of Quasar Emission-Line Region Sizes. *C. Martin Gaskell and Bradley M. Peterson*. **65**, 1, 28-A5 (1987) (Abstr. in **319**, 1011, 106-A9)
- GATLEY, I. The Broad-Line Region at the Center of the Galaxy. *T. R. Geballe, R. Wade, K. Krisciunas, I. Gatley, and M. C. Bird*. **320**, 562, 115-F12 (1987)
- Ionization State in and Reddening to the Center of the Galaxy. *R. Wade, T. R. Geballe, K. Krisciunas, I. Gatley, and M. C. Bird*. **320**, 570, 115-G7 (1987)
- GATLEY, IAN. Fluorescent Molecular Hydrogen Emission from the Reflection Nebula NGC 2023. *Ian Gatley, Tetsuo Hasegawa, Hiroko Suzuki, Ron Garden, Peter Brand, John Lightfoot, William Glencross, Haruyuki Okuda, and Tetsuya Nagata*. **318**, L73, 92-D4 (1987)
- Level Population and Para/Ortho Ratio of Fluorescent H_2 in NGC 2023. *Tetsuo Hasegawa, Ian Gatley, Ron P. Garden, Peter W. J. L. Brand, Masatoshi Ohishi, Masahiko Hayashi, and Norio Kaifu*. **318**, L77, 92-D12 (1987)
- GAUME, RALPH A. A Study of the Ground-State Hydroxyl Maser Emission Associated with 11 Regions of Star Formation. *Ralph A. Gaume and Robert L. Mutel*. **65**, 193, 31-A5 (1987) (Abstr. in **320**, 936,

- 120-B1)
- GAUTSCHY, A. Overtone Pulsation in Stars. *R. F. Stellingwerf, A. Gautschy, and R. J. Dickens*. **313**, L75, 27-D2 (1987)
- GAVAZZI, GIUSEPPE. 21 Centimeter Study of Spiral Galaxies in the Coma Supercluster. *Giuseppe Gavazzi*. **320**, 96, 109-B3 (1987)
- GAY, A. M. Ariel 6 Measurements of the Fluxes of Ultraheavy Cosmic Rays. *P. H. Fowler, R. N. F. Walker, M. R. W. Masheder, R. T. Moses, A. Worley, and A. M. Gay*. **314**, 739, 37-F7 (1987)
- GAYLEY, KENNETH G. Impulsive H α Diagnostics of Electron-Beam-Heated Solar Flare Model Chromospheres. *Richard C. Canfield and Kenneth G. Gayley*. **322**, 999, 150-G10 (1987)
- GEHALLE, T. R. Emission from CO Band Heads in Young Stellar Objects. *T. R. Geballe and S. E. Persson*. **312**, 297, 4-B8 (1987)
- Infrared Line Observations of Low-Luminosity Outflow Sources. *Howard A. Smith, J. Fischer, T. R. Geballe, and P. R. Schwartz*. **316**, 265, 52-G12 (1987)
- Discovery of Broad Brackett- α Emission in Arp 220. *D. L. DePoy, E. E. Becklin, and T. R. Geballe*. **316**, L63, 62-B8 (1987)
- Detection of Vibration-Rotation Band Lines of Shocked CO in Orion. *T. R. Geballe and Ron Garden*. **317**, L107, 78-E9 (1987)
- The Broad-Line Region at the Center of the Galaxy. *T. R. Geballe, R. Wade, K. Krisciunas, I. Gatley, and M. C. Bird*. **320**, 562, 115-F12 (1987)
- Ionization State in and Reddening to the Center of the Galaxy. *R. Wade, T. R. Geballe, K. Krisciunas, I. Gatley, and M. C. Bird*. **320**, 570, 115-G7 (1987)
- Molecular Hydrogen Line Emission in Seyfert Galactic Nuclei. *J. Fischer, T. R. Geballe, Howard A. Smith, M. Simon, and J. W. V. Storey*. **320**, 667, 117-B2 (1987)
- GEHALLE, THOMAS. Near-Infrared Spectra of Seyfert Nuclei. I. The Reddening Problem. *Martin J. Ward, Thomas Geballe, Malcolm Smith, Richard Wade, and Peredur Williams*. **316**, 138, 51-D13 (1987)
- GEHRELS, NEIL. Prospects for Observations of Nucleosynthetic Gamma-Ray Lines and Continuum from SN 1987A. *Neil Gehrels, Crawford J. MacCallum, and Marvin Leventhal*. **320**, L19, 114-B10 (1987)
- Prospects for Gamma-Ray Line Observations of Individual Supernovae. *Neil Gehrels, Marvin Leventhal, and Crawford J. MacCallum*. **322**, 215, 140-C3 (1987)
- GEHRZ, R. D. Velocity Structure of Stellar Atmospheres: R Scuti. *David Mozurkewich, R. D. Gehrz, K. H. Hinkle, and D. L. Lambert*. **314**, 242, 30-F12 (1987)
- GELDZAHLER, BARRY. Search for X-Ray Emission from the Radio Lobes of Scorpius X-1. *Barry Geldzahler and Paul Hertz*. **322**, 342, 141-E5 (1987)
- GELDZAHLER, BARRY J. Multifrequency VLBI Observations of 4C 39.25: A Superluminal Source without a Well-defined Core. *Alan P. Marscher, David B. Shafer, Roy S. Booth, and Barry J. Geldzahler*. **319**, L69, 107-D7 (1987)
- GENET, R. M. Discovery of Optical Circular Polarization in Lambda Andromedae. *J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook*. **317**, L29, 71-C2 (1987)
- GENZEL, R. Detection of Interstellar CH in the Far-Infrared. *Gordon J. Stacey, J. B. Lugten, and R. Genzel*. **313**, 859, 26-B9 (1987)
- Warm Dense Gas in Luminous Protostellar Regions: A Submillimeter and Far-Infrared CO Line Study. *D. T. Jaffe, A. I. Harris, and R. Genzel*. **316**, 231, 52-E1 (1987)
- The Dispersal of Dense Protostellar Material: NH $_3$ Hot Cores and Outflows in Sagittarius B2. *S. N. Vogel, R. Genzel, and Patrick Palmer*. **316**, 243, 52-F3 (1987)
- Aperture Synthesis Observations of the Circumnuclear Ring in the Galactic Center. *R. Güsten, R. Genzel, M. C. H. Wright, D. T. Jaffe, J. Stutzki, and A. I. Harris*. **318**, 124, 80-C8 (1987)
- Far-Infrared Measurements of N/O in H II Regions: Evidence for Enhanced CN Process Nucleosynthesis in the Inner Galaxy. *D. F. Lester, H. L. Dinerstein, M. W. Werner, D. M. Watson, R. Genzel, and J. W. V. Storey*. **320**, 573, 116-A1 (1987)
- Interpretation of Rotationally Excited Far-Infrared OH Emission in Orion-KL. *G. J. Melnick, R. Genzel, and J. B. Lugten*. **321**, 530, 127-G10 (1987)
- Submillimeter and Far-Infrared Spectroscopy of M17 and S106: UV-Heated, Quiescent Molecular Gas? *A. I. Harris, J. Stutzki, R. Genzel, J. B. Lugten, G. J. Stacey, and D. T. Jaffe*. **322**, L49, 145-D6 (1987)
- GERHARDY, P. R. Sporadic and Periodic 10-1000 TeV Gamma Rays from Cygnus X-3. *R. M. Baltrusaitis, G. L. Cassidy, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebing, C. P. Lingle, E. C. Loh, P. Sokolsky, P. Sommers, and D. Steck*. **323**, 685, 162-C1 (1987)
- GEROYANNIS, V. S. Numerical Implementation of a Perturbation Theory Up to Third Order for Rotating Polytropic Stars: Structure Parameters under Differential Rotation. *V. S. Geroyannis and F. N. Vahli*. **312**, 219, 3-C12 (1987)
- GEYER, E. H. Ultraviolet Observations by the IUE of 31 Clusters of the Large Magellanic Cloud. *A. Cassatella, J. Barbero, and E. H. Geyer*. **64**, 83, 18-A7 (1987) (Abstr. in **314**, 832, 38-F8)
- GEZARI, D. Y. Structure in the Nucleus of NGC 1068 at 10 Microns. *R. Tresch-Fienberg, G. G. Fazio, D. Y. Gezari, W. F. Hoffmann, G. M. Lamb, P. K. Shu, and C. R. McCreight*. **312**, 542, 8-G2 (1987)
- GHOSH, P. Dark Matter in the Universe: Massive Neutrinos Revisited. *R. Cowsik and P. Ghosh*. **317**, 26, 64-C4 (1987)
- A New Example of the Papaloizou-Pringle Instability. *M. A. Abramowicz, O. M. Blaes, and P. Ghosh*. **323**, 629, 161-E10 (1987)
- GIACCONI, RICCARDO. X-Ray Background, Discrete Sources, and Diffuse Processes. *Riccardo Giacconi and Giovanni Zamorani*. **313**, 20, 15-B12 (1987)
- GIAMPAPA, M. S. Formation of Chromospheric Lines in Cool Dwarf Stars. *L. E. Cram and M. S. Giampapa*. **323**, 316, 156-D13 (1987)
- GIAMPAPA, MARK S. Magnetic Field Measurements on the Sun and Implications for Stellar Magnetic Field Observations. *Wei-Hsin Sun, Mark S. Giampapa, and Simon P. Worden*. **312**, 930, 13-B1 (1987)
- GIBSON, D. M. An IUE Survey of Activity in Red Giants and Supergiants. *I. Ozonovich and D. M. Gibson*. **319**, 383, 97-C10 (1987)
- GIES, D. R. The Kinematical and Binary Properties of Association and Field O Stars. *D. R. Gies*. **64**, 545, 24-G2 (1987) (Abstr. in **317**, 1003, 77-B6)
- GIL, JANUSZ A. Orthogonal Polarization Modes in PSR 0834 + 06. *Janusz A. Gil*. **314**, 629, 36-D7 (1987)
- GILDEN, D. Reconnection-driven Oscillations in Dwarf Novae Disks. *T. Tajima and D. Gilden*. **320**, 741, 117-G10 (1987)
- GILLET, F. C. Physical Processes and Infrared Emission from the Cassiopeia A Supernova Remnant. *E. Dwek, H. L. Dinerstein, F. C. Gillet, M. G. Hauser, and W. L. Rice*. **315**, 571, 47-A1 (1987)
- GILLILAND, RONALD L. Hypercharge, Solar Structure, and Stellar Evolution. *Ronald L. Gilliland and Werner Däppen*. **313**, 429, 19-F7 (1987)
- Objective Characterization of Stellar Activity Cycles. I. Methods and Solar Cycle Analyses. *Ronald L. Gilliland and Sallie L. Balunas*. **314**, 766, 38-A6 (1987)
- GILMAN, PETER A. The Influence of the Coriolis Force on Flux Tubes Rising through the Solar Convection Zone. *Arnab Rai Choudhuri and Peter A. Gilman*. **316**, 788, 60-F7 (1987)
- Inertial Oscillations in the Solar Convection Zone. III. A Cylindrical Model for Nonaxisymmetric Oscillations in a Superadiabatic Gradient. *Peter A. Gilman*. **318**, 904, 90-G6 (1987)
- GILRA, D. P. Extinction and Abundance Properties of Alpha Scorpii Circumstellar Grains. *Theodore P. Snow, Jr., Richard H. Buss, Jr., D. P. Gilra, and J. P. Swings*. **321**, 921, 134-E13 (1987)
- GIOIA, I. M. 1E 0116.3 - 0116: A Peculiar, X-Ray-Bright, Early-Type Galaxy. *D. Maccagni, I. M. Gioia, T. Maccacaro, R. E. Schild, and J. T. Stocke*. **316**, 132, 51-D6 (1987)
- X-Ray and Optical Observations of X-Ray-Selected BL Lacertae Objects. *P. Giommi, P. Barr, B. Garilli, I. M. Gioia, T. Maccacaro, D. Maccagni, and R. E. Schild*. **322**, 662, 146-A10 (1987)
- GIOIA, ISABELLA M. 1E 1048.5 + 5421: A New 114 Minute AM Herculis Binary. *Simon L. Morris, Gary D. Schmidt, James Liebert, John Stocke, Isabella M. Gioia, and Tommaso Maccacaro*. **314**, 641, 36-E8 (1987)
- X-Ray-Selected AGNs near Bright Galaxies. *John T. Stocke, Peter Schneider, Simon L. Morris, Isabella M. Gioia, Tommaso Maccacaro, and Rudolph E. Schild*. **315**, L11, 45-A14 (1987)
- Radio Continuum Observations of Early- and Late-Type Spiral Galaxies. *Isabella M. Gioia and Giuseppina Fabbiano*. **63**, 771, 13-A13 (1987) (Abstr. in **314**, 831, 38-F7)
- GIOMMI, P. X-Ray Studies of Quasars with the EINSTEIN OBSERVATORY. IV. X-Ray Dependence on Radio Emission. *D. M. Worrall, P. Giommi, H. Tananbaum, and G. Zamorani*. **313**, 596, 23-C9 (1987)
- X-Ray and Optical Observations of X-Ray-Selected BL Lacertae Objects. *P. Giommi, P. Barr, B. Garilli, I. M. Gioia, T. Maccacaro, D. Maccagni, and R. E. Schild*. **322**, 662, 146-A10 (1987)
- GIOVANARDI, CARLO. Atomic Hydrogen in Planetary Nebulae. *Stephen E. Schneider, Peter R. Silverglate, Daniel R. Altschuler, and Carlo Giovanardi*. **314**, 572, 35-G1 (1987)
- GIOVANELLI, RICCARDO. The Structure and Evolution of Hoag's Object. *François Schweizer, W. Kent Ford, Jr., Robert Jedrzejewski, and Riccardo Giovanelli*. **320**, 454, 114-D3 (1987)
- Far-Infrared Properties of Cluster Galaxies. *Michael D. Bicay and Riccardo Giovanelli*. **321**, 645, 131-E11 (1987)
- GIOVANNONI, P. Molecule Formation in Quasar Broad-Line Cloud Gas. *T. Kallman, S. Lepp, and P. Giovannoni*. **321**, 907, 134-D13 (1987)
- GIROUX, MARK L. Cosmological H II Regions and the Photoionization of the Intergalactic Medium. *Paul R. Shapiro and Mark L. Giroux*. **321**, L107, 137-A13 (1987)
- GLASSGOLD, A. E. The Ultraviolet Spectra of Intermediate-Redshift

- Quasars. II. A. L. Kinney, P. J. Huggins, A. E. Glassgold, and J. N. Bregman. **314**, 145, 29-E7 (1987)
- Photochemistry and Molecular Ions in Oxygen-rich Circumstellar Envelopes. G. A. Mamon, A. E. Glassgold, and A. Omont. **323**, 306, 156-D3 (1987)
- GLASSGOLD, ALFRED E. Radio Observations of Carbon Monoxide toward Zeta Ophiuchi: Velocity Structure, Isotopic Abundances, and Physical Properties. William D. Langer, Alfred E. Glassgold, and Robert W. Wilson. **322**, 450, 142-G9 (1987)
- GLENCROSS, WILLIAM. Fluorescent Molecular Hydrogen Emission from the Reflection Nebula NGC 2023. Ian Gatley, Tetsuo Hasegawa, Hiroko Suzuki, Ron Garden, Peter Brand, John Lightfoot, William Glencross, Haruyuki Okuda, and Tetsuya Nagata. **318**, L73, 92-D4 (1987)
- GLINER, ERAST B. Formation of a Solar Coronal Transient with Fore-runner. Erast B. Gliner and Vladimir A. Osherovich. **312**, 412, 5-C12 (1987)
- GLOSSON, JOHN. H I Detection Survey of a Complete Magnitude-limited Sample of Dwarf Irregular Galaxies in the Virgo Cluster Area. G. Lyle Hoffman, George Helou, E. E. Salpeter, John Glosson, and A. Sandage. **63**, 247, 4-A5 (1987) (Abstr. in **312**, 964, 13-E5)
- GOLDEN, R. L. A Reexamination of the Cosmic-Ray Helium Spectrum and the $^3\text{He}/^4\text{He}$ Ratio at High Energies. W. R. Webber, R. L. Golden, and R. A. Mewaldt. **312**, 178, 2-G13 (1987)
- GOLDHABER, D. M. New Lines of Ethylene and a Search for Methylene in IRC +10216. D. M. Goldhaber, A. L. Betz, and J. J. Ottusch. **314**, 356, 32-A13 (1987)
- GOLDHABER, M. see SVOBODA, R. et al.
- GOLDSMITH, PAUL F. 1300 Micron Continuum Observations of the Sagittarius B2 Molecular Cloud Core. Paul F. Goldsmith, Ronald L. Snell, and Dariusz C. Lis. **313**, L5, 21-A8 (1987)
- Small-Scale Structure and Chemical Differential in the Central Regions of the Sagittarius B2 Molecular Cloud. Paul F. Goldsmith, Ronald L. Snell, T. Hasegawa, and N. Ukita. **314**, 525, 35-C6 (1987)
- Models of Molecular Cloud Cores. III. A Multitransition Study of H₂CO. Lee G. Mundy, Neal J. Evans II, Ronald L. Snell, and Paul F. Goldsmith. **318**, 392, 83-B11 (1987)
- A Survey of IRAS Point Sources in Taurus for High-Velocity Molecular Gas. Mark H. Heyer, Ronald L. Snell, Paul F. Goldsmith, and Philip C. Myers. **321**, 370, 126-C3 (1987)
- The Magnetic Evolution of the Taurus Molecular Clouds. I. Large-scale Properties. Mark H. Heyer, Frederick J. Vrba, Ronald L. Snell, F. P. Schloerb, Stephen E. Strom, Paul F. Goldsmith, and Karen M. Strom. **321**, 855, 133-G9 (1987)
- GOLDWURM, A. EXOSAT and Einstein Observations of the X-Ray Pulsar 4U 1145 - 619. S. Mereghetti, G. F. Bignami, P. A. Caraveo, and A. Goldwurm. **312**, 755, 11-B11 (1987)
- Diffuse Einstein X-Ray Emission from the Region of RCW 49, a Bright Southern Emission Nebula. A. Goldwurm, P. A. Caraveo, and G. F. Bignami. **322**, 349, 141-E12 (1987)
- GOLLIEZ, F. Solar Neutron Emission During the Large Flare on 1982 June 3. E. L. Chupp, H. Debrunner, E. Flückiger, D. J. Forrest, F. Golliez, G. Kanbach, W. T. Vestrand, J. Cooper, and G. Share. **318**, 913, 91-A1 (1987)
- GOLUB, L. Einstein Observatory Survey of X-Ray Emission from Solar-Type Stars: The Late F and G Dwarf Stars. A. Maggio, S. Sciortino, G. S. Vaiana, P. Majer, J. Bookbinder, L. Golub, F. R. Harnden, Jr., and R. Rosner. **315**, 687, 48-B8 (1987)
- Rapid, Low-Level X-Ray Variability in Active Late-Type Dwarfs. Carol W. Ambruster, Salvatore Sciortino, and L. Golub. **65**, 273, 32-B4 (1987) (Abstr. in **319**, 1012, 106-A10)
- GOMEZ, A. IRAS 18059 - 3211: Optically Known As Gomez's Hamburger: Erratum. M. T. Ruiz, V. Blanco, J. Maza, S. Heathcote, A. Phillips, K. Kawara, C. Anguita, M. Hamuy, and A. Gomez. **320**, L157, 121-F14 (1987) (Orig. paper in **316**, L21, 56-B10)
- GÓMEZ, ARTURO. IRAS 1809 - 3211: Optically Known as "Gomez's Hamburger". Maria Teresa Ruiz, Victor Blanco, José Maza, Steve Heathcote, Andrew Phillips, Kimiaki Kawara, Claudio Anguita, Mario Hamuy, and Arturo Gómez. **316**, L21, 56-B10 (1987)
- GOODMAN, JEREMY. On Gravothermal Oscillations. Jeremy Goodman. **313**, 576, 23-B1 (1987)
- Neutrino Annihilation in Type II Supernovae. Jeremy Goodman, Arnon Dar, and Shmuel Nussinov. **314**, L7, 33-B9 (1987)
- GORDON, G. A. The Distance to M5 from Its RR Lyrae Variables. J. G. Cohen and G. A. Gordon. **318**, 215, 81-C4 (1987)
- GORDON, M. A. The Continuum Spectra of Dust Complexes Associated with W3 Main, M42, W49A, and W51A. M. A. Gordon. **316**, 258, 52-G5 (1987)
- Maps of Dust Clouds at 1.3 Millimeters Associated with Bright H II Regions. M. A. Gordon and P. R. Jewell. **323**, 766, 163-B5 (1987)
- GORENSTEIN, M. V. VLBI Observations of 23 Hot Spots in the Starburst Galaxy M82. N. Bartel, M. I. Ratner, A. E. E. Rogers, I. I. Shapiro, R. J. Bonometti, N. L. Cohen, M. V. Gorenstein, J. M. Marcaide, and R. A. Preston. **323**, 505, 160-B3 (1987)
- GÖRRES, JOACHIM. Alpha-Burning of ^{14}O . Michael Wiescher, Volker Harms, Joachim Görres, Friedrich-Karl Thielemann, and Lawrence J. Rybaczek. **316**, 162, 51-F10 (1987)
- GÓRSKI, KRZYSZTOF. Minimal Cosmic Background Fluctuations Implied by Streaming Motions. Roman Juszkiewicz, Krzysztof Górski, and Joseph Silk. **323**, L1, 158-A4 (1987)
- GOSWAMI, J. N. Evidence in Meteorites for an Active Early Sun. M. W. Caffee, C. M. Hohenberg, T. D. Swindle, and J. N. Goswami. **313**, L31, 21-C3 (1987)
- ^{16}O Excesses in Murchison and Murray Hibonites: A Case Against a Late Supernova Injection Origin of Isotopic Anomalies in O, Mg, Ca, and Ti. A. J. Fahey, J. N. Goswami, K. D. McKeegan, and E. K. Zinner. **323**, L91, 158-G5 (1987)
- GOTT, J. RICHARD, III. The Spatial Distribution of Dwarf Galaxies in the CFA Slice of the Universe. Trinh X. Thuan, J. Richard Gott III, and Stephen E. Schneider. **315**, L93, 49-C2 (1987)
- A Quantitative Approach to the Topology of Large-Scale Structure. J. Richard Gott III, David H. Weinberg, and Adrian L. Melott. **319**, 1, 93-A7 (1987)
- The Topology of Large-Scale Structure. Topology and the Random Phase Hypothesis. David H. Weinberg, J. Richard Gott III, and Adrian L. Melott. **321**, 2, 122-A8 (1987)
- GOTTLIEB, C. A. Laboratory and Astronomical Spectroscopy of C₃H₂, the First Interstellar Organic Ring. J. M. Vrilek, C. A. Gottlieb, and P. Thaddeus. **314**, 716, 37-D8 (1987)
- The Radio Spectrum of Cyclopropene. J. M. Vrilek, C. A. Gottlieb, T. J. LePape, and P. Thaddeus. **316**, 826, 61-B4 (1987)
- GOTTWALD, M. EXOSAT Observations of Double-peaked Bursts with Radius Expansion from 4U/MXB 1820 - 30. F. Haberl, L. Stella, N. E. White, W. C. Priedhorsky, and M. Gottwald. **314**, 266, 31-A9 (1987)
- EXOSAT Observations of 4U 1705 - 44: Type I Bursts and Persistent Emission. A. Langmeier, M. Sztajno, G. Hasinger, J. Trümper, and M. Gottwald. **323**, 288, 156-B13 (1987)
- The Properties of Bursts with Short Recurrence Times from the Transient X-Ray Source EXO 0748 - 676. M. Gottwald, F. Haberl, A. N. Parmar, and N. E. White. **323**, 575, 161-A11 (1987)
- GOUDA, NAOTERU. Small-scale Anisotropies in the Microwave Background in a Baryon-dominated Open Universe. Naoteru Gouda, Misao Sasaki, and Yasushi Suto. **321**, L1, 129-B4 (1987)
- GOULD, ANDREW. Weakly Interacting Massive Particle Distribution in and Evaporation from the Sun. Andrew Gould. **321**, 560, 128-C3 (1987)
- Resonant Enhancements in Weakly Interacting Massive Particle Capture by the Earth. Andrew Gould. **321**, 571, 128-D1 (1987)
- GRABELSKY, D. A. Molecular Clouds in the Carina Arm: Large-Scale Properties of Molecular Gas and Comparison with H I. D. A. Grabelsky, R. S. Cohen, L. Bronfman, P. Thaddeus, and J. May. **315**, 122, 41-D2 (1987)
- GRABOWSKI, B. The Impact of the Pressure Shift of Hydrogen Lines on "Relativistic" Masses of White Dwarfs. B. Grabowski, J. Madej, and J. Halenka. **313**, 750, 25-A8 (1987)
- GRADY, C. A. Highly Ionized Stellar Winds in Be Stars: The Evidence for Aspect Dependence. C. A. Grady, K. S. Bjorkman, and T. P. Snow. **320**, 376, 112-B8 (1987)
- Recurrent Episodic Mass Loss in a B2e Star: 66 Ophiuchi, 1982-1985. C. A. Grady, George Sonneborn, Chi-Chao Wu, and H. F. Henrichs. **65**, 673, 39-A2 (1987) (Abstr. in **322**, 1077, 151-G3)
- GRAFF, M. M. Oxygen Chemistry of Shocked Interstellar Clouds. I. Rate Constants for Thermal and Nonthermal Internal Energy Distributions. A. F. Wagner and M. M. Graff. **317**, 423, 68-E11 (1987)
- Oxygen Chemistry of Shocked Interstellar Clouds. II. Effects of Non-thermal Internal Energy on Chemical Evolution. M. M. Graff and A. Dalgarno. **317**, 432, 68-F6 (1987)
- GRAFF, S. M. The Unusual Dust-scattering Properties in the Reflection Nebula CED 201. A. N. Witt, R. C. Bohlin, T. P. Stecher, and S. M. Graff. **321**, 912, 134-E4 (1987)
- GRAHAM, J. A. Evidence for a Central Massive Component in Late-Type Spirals. Vera C. Rubin and J. A. Graham. **316**, L67, 62-B12 (1987)
- GRAHAM, JAMES R. Infrared Spectroscopy of the Supernova Remnant IC 443. James R. Graham, Gillian S. Wright, and Andrew J. Longmore. **313**, 847, 26-A7 (1987)
- The Bolometric Light Curve of a Carbon Deflagration Supernova. James R. Graham. **315**, 588, 47-B4 (1987)
- Deflagrating White Dwarfs and the Statistical Properties of Type I Supernovae. James R. Graham. **318**, L47, 92-B8 (1987)
- IRAS Observations of Collisionally Heated Dust in Large Magellanic Cloud Supernova Remnants. James R. Graham, A. Evans, J. S.

- Albinson, M. F. Bode, and W. P. S. Meikle. **319**, 126, 94-D5 (1987)
- GRAPS, A. Solar Cycle Study of Interplanetary Lyman-Alpha Variations: PIONEER VENUS Orbiter Sky Background Results. *J. M. Ajello, A. I. Stewart, G. E. Thomas, and A. Graps*. **317**, 964, 76-F5 (1987)
- GRASDALEN, G. L. CS Observations of L1551: No Rotating Disk. *G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, and G. L. GrasdaLEN*. **317**, L95, 78-D13 (1987)
- High-Resolution Images of the L1551 Bipolar Outflow: Evidence for an Expanding, Accelerated Shell. *G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, F. P. Schloerb, K. M. Strom, and G. L. GrasdaLEN*. **319**, 742, 103-B6 (1987)
- GRAUER, ALBERT D. PG 0122 + 200: A New Member of the GW Virginis (PG 1159 - 035) Class of Extremely Hot Pulsating White Dwarfs. *Howard E. Bond and Albert D. Grauer*. **321**, L123, 137-C1 (1987)
- A Search for Pulsating Stars Similar to PG 1159 - 035 and K1-16. *Albert D. Grauer, Howard E. Bond, James Liebert, Thomas A. Fleming, and Richard F. Green*. **323**, 271, 156-A10 (1987)
- GRAY, DAVID F. An Analysis of the Photospheric Line Profiles in F, G, and K Supergiants. *David F. Gray and C. G. Toner*. **322**, 360, 141-G1 (1987)
- GRAY, R. O. The Early A Type Stars: Refined MK Classification, Confrontation with Strömgen Photometry, and the Effects of Rotation. *R. O. Gray and R. F. Garrison*. **65**, 581, 37-C1 (1987) (Abstr. in **322**, 1076, 151-G2)
- GREDEL, R. The C/CO Ratio in Dense Interstellar Clouds. *R. Gredel, S. Lepp, and A. Dalgarno*. **323**, L137, 164-D12 (1987)
- GREEN, K. D. Sporadic and Periodic 10-1000 TeV Gamma Rays From Cygnus X-3. *R. M. Baltrusaitis, G. L. Cassiday, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebing, C. P. Lingle, E. C. Loh, P. Sokolsky, P. Sommers, and D. Steck*. **323**, 685, 162-C1 (1987)
- GREEN, R. F. Continuum Energy Distributions of Quasars in the Palomar-Green Survey. *G. Neugebauer, R. F. Green, K. Matthews, M. Schmidt, B. T. Soifer, and J. Bennett*. **63**, 615, 10-A7 (1987) (Abstr. in **313**, 929, 26-G12)
- GREEN, RICHARD F. High-Resolution Spectroscopy of the $z = 1.79$ Absorption-Line System toward B2 1225 + 317. *Jill Bechtold, Richard F. Green, and D. G. York*. **312**, 50, 1-E5 (1987)
- X-Ray Spectra of PG Quasars. II. The X-Ray-Ultraviolet Excess of PG 1211 + 143. *Jill Bechtold, Bozena Czerny, Martin Elvis, G. Fabbiano, and Richard F. Green*. **314**, 699, 37-C5 (1987)
- The DBA White Dwarf Stars in the Palomar-Green Sample. *Harry L. Shipman, James Liebert, and Richard F. Green*. **315**, 239, 42-E8 (1987)
- BE Ursae Majoris: A Detached Binary with a Unique Reprocessing Spectrum. *Donald H. Ferguson, James Liebert, Roc Cutri, Richard F. Green, S. P. Willner, João E. Steiner, and Susan Tokarz*. **316**, 399, 54-D4 (1987)
- Surveys of Fields around Quasars. IV. Luminosity of Galaxies at $z \approx 0.6$ and Preliminary Evidence for the Evolution of the Environment of Radio-loud Quasars. *H. K. C. Yee and Richard F. Green*. **319**, 28, 93-C12 (1987)
- The Rotationally Modulated Zeeman Spectrum at Nearly 10^9 Gauss of the White Dwarf PG 1031 + 234. *William B. Latter, Gary D. Schmidt, and Richard F. Green*. **320**, 308, 111-D9 (1987)
- PG 1411 + 442: The Nearest Broad Absorption Line Quasar. *Matthew A. Malkan, Richard F. Green, and John B. Hutchings*. **322**, 729, 147-G6 (1987)
- A Search for Pulsating Stars Similar to PG 1159 - 035 and K1-16. *Albert D. Grauer, Howard E. Bond, James Liebert, Thomas A. Fleming, and Richard F. Green*. **323**, 271, 156-A10 (1987)
- GREEN, SHELDON. Collisional Excitation of an Asymmetric Rotor, Silicon Dicarboxide. *Amedeo Palma and Sheldon Green*. **316**, 830, 61-B9 (1987)
- Collisional Excitation of Interstellar Cyclopropenylidene. *Sheldon Green, D. J. DeFrees, and A. D. McLean*. **65**, 175, 29-F11 (1987) (Abstr. in **319**, 1013, 106-A11)
- GREENBERG, J. MAYO. Ions in Grain Mantles: The 4.62 Micron Absorption by OCN⁻ in W33A. *Ruud J. A. Grim and J. Mayo Greenberg*. **321**, L91, 130-A11 (1987)
- GREGORY, B. Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. *V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storchi-Bergmann, and J. Matthews*. **320**, 589, 116-B3 (1987)
- GREGORY, BROOKE. Infrared Photometry and Spectroscopy of Supernova 1986g in NGC 5128-Centaurus A. *Jay A. Frogel, Brooke Gregory, Kimiaki Kawara, Dave Laney, M. M. Phillips, Don Terndrup, Frederick Vrba, and Albert E. Whitford*. **315**, L129, 49-E11 (1987)
- Two Micron Spectroscopy of IRAS Galaxies. *Kimiaki Kawara, Minoru Nishida, and Brooke Gregory*. **321**, L35, 129-D12 (1987)
- GREGORY, STEPHEN A. Emission-Line Galaxies in the Bootes Void. *J. Ward Moody, Robert P. Kirshner, Gordon M. MacAlpine, and Stephen A. Gregory*. **314**, L33, 39-A13 (1987)
- GRENIER, I. A. A Composite CO Survey of the Entire Milky Way. *T. M. Dame, H. Ungerechts, R. S. Cohen, E. J. de Geus, J. A. Grenier, J. May, D. C. Murphy, L.-A. Nyman, and P. Thaddeus*. **322**, 706, 147-D13 (1987)
- GRESH, DONNA L. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. *John D. Anderson, Timothy P. Krisher, Susan E. Borutski, Michael J. Connally, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Taylor, Donna L. Gresh, and Paul A. Rosen*. **323**, L141, 164-E1 (1987)
- GRIESINGER, H. E. Absolute Oscillator Strengths for 108 Lines of Si I between 163 and 410 Nanometers. *Peter L. Smith, M. C. E. Huber, G. P. Tozzi, H. E. Griesinger, B. L. Cardon, and G. G. Lombardi*. **322**, 573, 144-B12 (1987)
- GRIEVE, G. R. Interdependence of the 4430 Å Diffuse Interstellar Band, Polarization, and Ultraviolet Extinction. *J. Krelowski, G. A. H. Walker, G. R. Grieve, and G. M. Hill*. **316**, 449, 55-A3 (1987)
- GRIFFIN, R. F. On the Reality of Certain Spectroscopic Orbits. *C. L. Morbey and R. F. Griffin*. **317**, 343, 67-F1 (1987)
- GRIM, RUUD J. A. Ions in Grain Mantles: The 4.62 Micron Absorption by OCN⁻ in W33A. *Ruud J. A. Grim and J. Mayo Greenberg*. **321**, L91, 130-A11 (1987)
- GRINDLAY, J. E. Persistent Emission and Bursts from Aquila X-1 Observed by Einstein. *M. Czerny, B. Czerny, and J. E. Grindlay*. **312**, 122, 2-C13 (1987)
- A Search for Millisecond Periodic and Quasi-periodic Pulsations in Low-Mass X-Ray Binaries. *S. Mereghetti and J. E. Grindlay*. **312**, 727, 10-G6 (1987)
- GRINDLAY, JONATHAN E. Compact X-Ray Binaries in Hierarchical Triples. I. Tidal Angular Momentum Loss and GX 17 + 2. *Charles D. Bailyn and Jonathan E. Grindlay*. **312**, 748, 11-B4 (1987)
- Discovery of an X-Ray Burst from 4U 2129 + 47. *Michael R. Garcia and Jonathan E. Grindlay*. **313**, L59, 27-C1 (1987)
- On the Evolution of Tidal Capture X-Ray Binaries: 4U 2127 + 12 (M15) to 4U 1820 - 30 (NGC 6624). *Charles D. Bailyn and Jonathan E. Grindlay*. **316**, L25, 56-C3 (1987)
- CCD Photometry of Globular Cluster Core Structure. I. NGC 6388, NGC 6624, and M15—One Flat Core and Two Cusps. *Phyllis M. Lugger, Haldan Cohn, Jonathan E. Grindlay, Charles D. Bailyn, and Paul Hertz*. **320**, 482, 114-F8 (1987)
- GRINSTEIN, B. Interpretation of Large-Scale Deviations from the Hubble Flow. *B. Grinstein, H. David Politzer, S.-J. Rey, and Mark B. Wise*. **314**, 431, 34-C1 (1987)
- GRINSTEIN, BENJAMIN. On the Validity of the Zel'dovich Approximation. *Benjamin Grinstein and Mark B. Wise*. **320**, 448, 114-C11 (1987)
- GROSSMAN, E. N. A Possible Protostar near HH 7-11. *E. N. Grossman, C. R. Masson, A. I. Sargent, N. Z. Scoville, S. Scott, and D. P. Woody*. **320**, 356, 112-A1 (1987)
- GRUBER, D. E. HEAO 1 Hard X-Ray Observations of Three Abell Clusters of Galaxies. *Y. Rephaeli, D. E. Gruber, and R. E. Rothschild*. **320**, 139, 109-E5 (1987)
- GRUBER, DUANE E. A Rapid Change of the Hercules X-1 Pulse Profile and High-State Duration. *Yang Soong, Duane E. Gruber, and Richard E. Rothschild*. **319**, L77, 107-E3 (1987)
- GRY, C. IUE Observations of Hydrogen and Deuterium in the Local Interstellar Medium. *J. Murthy, R. C. Henry, H. W. Moos, W. B. Landsman, J. L. Linsky, A. Vidal-Madjar, and C. Gry*. **315**, 675, 48-A10 (1987)
- GUÉLIN, M. Laboratory Microwave Spectroscopy of the Vibrational Satellites for the ν_2 and $2\nu_2$ States of C₂H and Their Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, M. Guélin, J. Cernicharo, Hiroko Suzuki, and Masatoshi Ohishi*. **323**, L149, 164-E8 (1987)
- GUENTHER, D. B. A Discussion of Epsilon Eridani's Age, Composition, and Oscillation Spectrum. *D. B. Guenther*. **312**, 211, 3-C4 (1987)
- GUHATHAKURTA, P. Interstellar Dust in Shapley-Ames Elliptical Galaxies. *M. Jura, D. W. Kim, G. R. Knapp, and P. Guhathakurta*. **312**, L11, 7-A13 (1987)
- GUILLORY, J. Radiation from Relativistic Beams Interacting with Interstellar Gas. *W. K. Rose, J. H. Beall, J. Guillory, and S. Kainer*. **314**, 95, 29-A12 (1987)
- GUILLLOTEAU, STÉPHANE. The Rich Molecular Spectrum and the Rapid Outflow of OH 231.8 + 4.2. *Mark Morris, Stéphane Guilloteau, Robert Lucas, and Alain Omont*. **321**, 888, 134-C8 (1987)
- GUINAN, E. F. Discovery of Optical Circular Polarization in Lambda Andromedae. *J. C. Kemp, G. D. Henson, D. J. Kraus, M. H.*

- Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook. 317, L29, 71-C2 (1987)
- Periodic Photospheric and Chromospheric Modulation in Alpha Orionis (Betelgeuse). A. K. Dupree, S. L. Baliunas, E. F. Guinan, L. Hartmann, G. E. Nassiopoulou, and G. Sonneborn. 317, L86, 78-D4 (1987)
- GULL, THEODORE R. Deep Einstein X-Ray Imagery of the Small Magellanic Cloud. Frederick C. Bruhweiler, Daniel A. Klinglesmith III, Theodore R. Gull, and Sabatino Sofia. 317, 152, 65-E11 (1987)
- Physical Parameters for 12 Planetary Nebulae and Their Central Stars in the Magellanic Clouds. Lawrence H. Aller, Charles D. Keyes, Stephen P. Maran, Theodore R. Gull, Andrew G. Michalitsianos, and Theodore P. Stecher. 320, 159, 109-F12 (1987)
- GUNN, J. E. The Triple Radio Source 0023 + 171: A Candidate for a Dark Gravitational Lens. J. N. Hewitt, E. L. Turner, C. R. Lawrence, D. P. Schneider, J. E. Gunn, C. L. Bennett, B. F. Burke, J. H. Mahoney, G. I. Langston, M. Schmidt, J. B. Oke, and J. G. Hoessel. 321, 706, 132-C5 (1987)
- GUNN, JAMES E. Nine Optically Selected Quasars with Redshifts Larger Than 3. Maarten Schmidt, Donald P. Schneider, and James E. Gunn. 316, L1, 56-A4 (1987)
- Galaxy Formation by Gravitational Collapse. Barbara S. Ryden and James E. Gunn. 318, 15, 79-B5 (1987)
- PC 0910 + 5625: An Optically Selected Quasar with a Redshift of 4.04. Maarten Schmidt, Donald P. Schneider, and James E. Gunn. 321, L7, 129-B10 (1987)
- GUPTA, S. S. Chromospheric Ca II K-Line Variations in the Sun as a Star over a Solar Cycle. K. R. Sivaraman, Jagdev Singh, S. P. Bagare, and S. S. Gupta. 313, 456, 20-A6 (1987)
- GURMAN, JOSEPH B. Simultaneous Measurements of Sunspot Umbral Oscillations in the Photosphere, Chromosphere, and Transition Region. John H. Thomas, Bruce W. Lites, Joseph B. Gurman, and Edwin F. Ladd. 312, 457, 5-G9 (1987)
- GUSTAFSSON, D. Spectroscopy of the Rapidly Rotating K Star HD 36705. O. Vilhu, B. Gustafsson, and B. Edvardsson. 320, 850, 119-B5 (1987)
- GUSTAFSSON, BENGT. Oxygen Isotopic Abundances in Evolved Stars. III. 26 Carbon Stars. Michael J. Harris, David L. Lambert, Kenneth H. Hinkle, Bengt Gustafsson, and Kjell Eriksson. 316, 294, 53-B14 (1987)
- GÜSTEN, R. Aperture Synthesis Observations of the Circumnuclear Ring in the Galactic Center. R. Güsten, R. Genzel, M. C. H. Wright, D. T. Jaffe, J. Stutzki, and A. I. Harris. 318, 124, 80-C8 (1987)
- GUZIK, JOYCE A. A Comparison between Mass-Losing and Standard Solar Models. Joyce A. Guzik, L. A. Willson, and Wendee M. Brunish. 319, 957, 105-D5 (1987)
- GUZIK, T. G. Cosmic Ray Propagation in the Galaxy and in the Heliosphere: The Path-Length Distribution at Low Energy. M. Garcia-Munoz, J. A. Simpson, T. G. Guzik, J. P. Wefel, and S. H. Margolis. 64, 269, 19-F6 (1987) (Abstr. in 315, 733, 48-E14)
- HAAG, CHESTER. Spectroscopy of the Optical Photosphere of the Hot Pulsating Star BW Vulpeculae. Ingemar Furenlid, Arthur Young, Thomas Meylan, Chester Haag, and Greg Crinklaw. 319, 264, 95-G9 (1987)
- HAAS, M. R. Far-Infrared Spectroscopy of Star Formation Regions in M82. P. B. Duff, E. F. Erickson, M. R. Haas, and J. R. Houck. 315, 68, 40-F6 (1987)
- HABERL, F. EXOSAT Observations of Double-peaked Bursts with Radius Expansion from 4U/MXB 1820 - 30. F. Haberl, L. Stella, N. E. White, W. C. Friedrichs, and M. Gottwald. 314, 266, 31-A9 (1987)
- The Properties of Bursts with Short Recurrence Times from the Transient X-Ray Source EXO 0748 - 676. M. Gottwald, F. Haberl, A. N. Parmar, and N. E. White. 323, 575, 161-A11 (1987)
- HACHISU, IZUMI. Fragmentation of Rapidly Rotating Gas Clouds. I. A Universal Criterion for Fragmentation. Izumi Hachisu, Joel E. Tohline, and Yoshiharu Eriguchi. 323, 592, 161-C1 (1987)
- HACKING, PERRY. A Very Deep IRAS Survey: Constraints on the Evolution of Starburst Galaxies. Perry Hacking, J. J. Condon, and J. R. Houck. 316, L15, 56-B4 (1987)
- Properties of Evolved Mass-Losing Stars in the Milky Way and Variations in the Interstellar Dust Composition. Harley A. Thronson, Jr., William B. Latter, John H. Black, John Bally, and Perry Hacking. 322, 770, 148-C5 (1987)
- A Very Deep IRAS Survey at $l = 97^\circ$, $b = 30^\circ$. Perry Hacking and J. R. Houck. 63, 311, 5-A3 (1987) (Abstr. in 312, 965, 13-E6)
- HACKNEY, K. R. see MAKINO, F., et al.
- HACKNEY, R. L. see MAKINO, F., et al.
- HACKWELL, JOHN A. The Discovery of an Infrared Reflection Nebula Surrounding R Coronae Australis IRS 5. Michael W. Castelaz and John A. Hackwell. 314, 317, 31-E9 (1987)
- Airborne Spectrophotometry of Eta Carinae from 4.5 to 7.5 Microns and a Model for Source Morphology. Ray W. Russell, David K. Lynch, John A. Hackwell, Richard J. Rudy, George S. Rossano, and M. W. Castelaz. 321, 937, 134-G1 (1987)
- HAGYARD, M. J. Nonpotential Features Observed in the Magnetic Field of an Active Region. G. A. Gary, R. L. Moore, M. J. Hagyard, and Bernhard M. Haisch. 314, 782, 38-B8 (1987)
- HAINES, T. J. see SVOBODA, R. et al.
- HAISCH, BERNHARD M. Nonpotential Features Observed in the Magnetic Field of an Active Region. G. A. Gary, R. L. Moore, M. J. Hagyard, and Bernhard M. Haisch. 314, 782, 38-B8 (1987)
- HALENKA, J. The Impact of the Pressure Shift of Hydrogen Lines on "Relativistic" Masses of White Dwarfs. B. Grabowski, J. Madej, and J. Halenka. 313, 750, 25-A8 (1987)
- HALL, D. N. B. Radial Velocities of Late-Type Stars in the Galactic Center. K. Sellgren, D. N. B. Hall, S. G. Kleinmann, and N. Z. Scoville. 317, 881, 75-F5 (1987)
- HALL, D. S. Discovery of Optical Circular Polarization in Lambda Andromedae. J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook. 317, L29, 71-C2 (1987)
- HALL, D. T. Electron Impact Excitation of H₂: Rydberg Band Systems and the Benchmark Dissociative Cross Section of H Lyman-Alpha. D. E. Shemansky, J. M. Ajello, and D. T. Hall. 315, 408, 44-C14 (1987) (Orig. paper in 296, 765, 98-D6)
- HALLIDAY, I. Evidence from Meteor Patrol Photographs for a Nonastromonomical Origin of the Reported Optical Flashes in Perseus. I. Halliday, P. A. Feldman, and A. T. Blackwell. 320, L153, 121-F11 (1987)
- HALPERN, J. P. Narrow-Line Seyfert Galaxies with Permitted Fe II Emission: Markarian 507, 5C 3.100, and I Zwicky 1. J. P. Halpern and J. B. Oke. 312, 91, 2-A9 (1987)
- A Hard X-Ray Source in the Nearest Molecular Cloud. J. P. Halpern and J. Patterson. 312, L31, 7-C2 (1987)
- The X-Ray Spectrum of NGC 1068. R. Monier and J. P. Halpern. 315, L17, 45-B6 (1987)
- HAMABATA, HIROMITSU. The α -Effect Generated by Random Alfvén Waves in a Stratified Atmosphere and Particle Acceleration. Tomikazu Namikawa, Hiromitsu Hamabata, and Hiroyuki Wada. 323, 414, 157-F3 (1987)
- HAMANN, F. The Infrared Emission-Line Spectrum of γ Cassiopeiae. F. Hamann and M. Simon. 318, 356, 82-F10 (1987)
- HAMEURY, J. M. The Evolution of Magnetic Cataclysmic Variables. J. M. Hameury, A. R. King, J. P. Lasota, and H. Ritter. 316, 275, 53-A9 (1987)
- HAMILTON, D. C. A Multispacecraft Study of the Injection and Transport of Solar Energetic Particles. J. Beek, G. M. Mason, D. C. Hamilton, G. Wibberenz, H. Kunow, D. Hoestadt, and B. Klecker. 322, 1052, 151-D14 (1987)
- HAMILTON, DON. Forbidden [O II] and [O III] Emission 29" from a QSO Absorption-Line Region. Brian Yanny, Don Hamilton, R. A. Schommer, T. B. Williams, and D. G. York. 323, L19, 158-B7 (1987)
- HAMILTON, DONALD. The Host Galaxy of Markarian 231. Donald Hamilton and William C. Keel. 321, 211, 124-E1 (1987)
- HAMILTON, RUSSELL J. Generation of Plasma Waves by Thick-Target Electron Beams and the Expected Radiation Signature. Russell J. Hamilton and Vahé Petrosian. 321, 721, 132-D6 (1987)
- HAMILTON, T. T. The Origin of the Diffuse X-Ray Background. T. T. Hamilton and D. J. Helfand. 318, 93, 80-A1 (1987)
- HAMUY, M. Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storch-Bergmann, and J. Matthews. 320, 589, 116-B3 (1987)
- IRAS 18059 - 3211: Optically Known As Gomez's Hamburger: Erratum. M. T. Ruiz, V. Blanco, J. Maza, S. Heathcote, A. Phillips, K. Kawara, C. Anguita, M. Hamuy, and A. Gomez. 320, L157, 121-F14 (1987) (Orig. paper in 316, L21, 56-B10)
- HAMUY, MARIO. IRAS 1809 - 3211: Optically Known As "Gomez's Hamburger". Maria Teresa Ruiz, Victor Blanco, José Maza, Steve Heathcote, Andrew Phillips, Kimiaki Kawara, Claudio Anguita, Mario Hamuy, and Arturo Gómez. 316, L21, 56-B10 (1987)
- HANAWA, TOMOYUKI. Thermal Evolution of Accreting Neutron Stars. II. Long X-Ray Bursts as a Probe Into the Interior. Masayuki Y. Fujimoto, Tomoyuki Hanawa, Icko Iben, Jr., and Martin B. Richardson. 315, 198, 42-B9 (1987)
- HANKINS, T. H. Improved Dispersion Measures for 17 Pulsars. T. H. Hankins. 312, 276, 3-B13 (1987)
- Improved Timing of the Millisecond Pulsar PSR 1937 + 21 Using Real-Time Coherent Dedispersion. T. H. Hankins, Daniel R. Stinebring, and Lloyd A. Rawley. 315, 149, 41-F1 (1987)
- The Drifting Subpulse Phenomenon Observed in Three Pulsars with

- Triple Profiles. *T. H. Hankins and A. Wolszczan*. **318**, 410, 83-D8 (1987)
- HANSEN, C. J. An Independent Method for Determining the Age of the Universe. *D. E. Winget, C. J. Hansen, James Liebert, H. M. Van Horn, G. Fontaine, R. E. Nather, S. O. Kepler, and D. Q. Lamb*. **315**, L77, 49-B1 (1987)
- HANTZIOS, PANAYIOTIS A. Time-resolved Spectrophotometry of the Cataclysmic Variable EX Hydrae. *Ronald H. Kaitchuck, Panayiotis A. Hantzios, Panagiotis Kakaletis, R. Kent Honeycutt, and Eric M. Schlegel*. **317**, 765, 74-D3 (1987)
- HARDEE, PHILIP E. Spatial Stability of Jets: The Nonaxisymmetric Fundamental and Reflection Modes. *Philip E. Hardee*. **313**, 607, 23-D6 (1987)
- Spatial Stability of Relativistic Jets: Application to 3C 345. *Philip E. Hardee*. **318**, 78, 79-F12 (1987)
- HARDING, ALICE K. Quantized Synchrotron Radiation in Strong Magnetic Fields. *Alice K. Harding and Robert Preece*. **319**, 939, 105-C1 (1987)
- HARKNESS, R. P. Supernovae 1983i and 1983v: Evidence for Abundance Variations in Type Ib Supernovae. *J. C. Wheeler, R. P. Harkness, E. S. Barker, A. L. Cochran, and D. Wills*. **313**, L69, 27-C11 (1987)
- The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. *R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Leoreault*. **317**, 355, 67-F14 (1987)
- HARLAN, EUGENE. The Incidence of Close Binaries among Stars of Low Mass: Astrophysical Binaries. *Arthur Young, Sina Sadjadi, and Eugene Harlan*. **314**, 272, 31-B1 (1987)
- HARMS, VOLKER. Alpha-Burning of ^{14}O . *Michael Wiescher, Volker Harms, Joachim Gürrés, Friedrich-Karl Thielemann, and Lawrence J. Rybarkczyk*. **316**, 162, 51-F10 (1987)
- HARNDEN, F. R., JR. Einstein Observatory Survey of X-Ray Emission from Solar-Type Stars: The Late F and G Dwarf Stars. *A. Maggio, S. Sciortino, G. S. Vaiana, P. Majer, J. Bookbinder, L. Golub, F. R. Harnden, Jr., and R. Rosner*. **315**, 687, 48-B8 (1987)
- X-Ray Observations of Solar Flares with the Einstein Observatory. *J. H. M. M. Schmitt, F. R. Harnden, Jr., and H. Fink*. **322**, 1023, 151-B6 (1987)
- HARPAZ, AMOS. Mass Accretion on a Collapsed Star. *Amos Harpaz and Nathan Rosen*. **312**, 646, 10-A7 (1987)
- Evolution of a $0.7 M_{\odot}$ Red Giant. *Amos Harpaz, Attay Kovetz, and Giora Shaviv*. **323**, 154, 154-F13 (1987)
- HARPER, D. A. Dust Reradiation from M43. *J. Smith, D. A. Harper, and R. F. Loewenstein*. **314**, 76, 28-G7 (1987)
- Star Formation in the Magellanic Irregular Galaxy NGC 4449. *Harley A. Thronson, Jr., Deidre A. Hunter, C. M. Telesco, D. A. Harper, and R. Decher*. **317**, 180, 66-A3 (1987)
- HARRINGTON, J. P. The Planetary Nebula NGC 3918. *R. E. S. Clegg, J. P. Harrington, M. J. Barlow, and J. R. Walsh*. **314**, 551, 35-E7 (1987)
- HARRIS, A. I. Warm Dense Gas in Luminous Protostellar Regions: A Submillimeter and Far-Infrared CO Line Study. *D. T. Jaffe, A. I. Harris, and R. Genzel*. **316**, 231, 52-E1 (1987)
- Aperture Synthesis Observations of the Circumnuclear Ring in the Galactic Center. *R. Güsten, R. Genzel, M. C. H. Wright, D. T. Jaffe, J. Stutzki, and A. I. Harris*. **318**, 124, 80-C8 (1987)
- Submillimeter and Far-Infrared Spectroscopy of M17 and S106: UV-Heated, Quiescent Molecular Gas? *A. I. Harris, J. Stutzki, R. Genzel, J. B. Lugten, G. J. Stacey, and D. T. Jaffe*. **322**, L49, 145-D6 (1987)
- HARRIS, A. W. Single Gaussian Curve of Growth Abundance Determinations from Ultraviolet Interstellar Absorption-Line Data. *A. W. Harris*. **322**, 368, 141-G9 (1987)
- HARRIS, C. J. The Solar Boron Abundance. *R. C. M. Learner and C. J. Harris*. **320**, 926, 120-A3 (1987)
- HARRIS, CRAIG C. Features in Saturn's Rings. *Larry W. Esposito, Craig C. Harris, and Karen E. Simmons*. **63**, 749, 11-G1 (1987) (Abstr. in **313**, 931, 26-G14)
- HARRIS, D. E. X-Rays from the Radio Halo of M87. *E. D. Feigelson, P. A. D. Wood, E. J. Schreier, D. E. Harris, and M. J. Reid*. **312**, 101, 2-B5 (1987)
- X-Ray Emission Associated with the Jet in 3C 273. *D. E. Harris and C. P. Stern*. **313**, 136, 16-D14 (1987)
- HARRIS, HUGH C. Blue Straggler Stars in the Globular Cluster NGC 5466. *James M. Nemec and Hugh C. Harris*. **316**, 172, 51-G7 (1987)
- HARRIS, MICHAEL J. Oxygen Isotopic Abundances in Evolved Stars. III. 26 Carbon Stars. *Michael J. Harris, David L. Lambert, Kenneth H. Hinkle, Bengt Gustafsson, and Kjell Eriksson*. **316**, 294, 53-B14 (1987)
- A Search for $^{13}\text{C}^{16}\text{O}$ in the Atmospheres of Evolved Stars. *Michael J. Harris and David L. Lambert*. **318**, 868, 90-D12 (1987)
- HARRIS, WILLIAM E. Globular Cluster Systems in the Supergiant Ellipticals of the Coma Cluster. *William E. Harris*. **315**, L29, 45-C6 (1987)
- HARTIGAN, PATRICK. Radiative Bow Shock Models of Herbig-Haro Objects. *Patrick Hartigan, John Raymond, and Lee Hartmann*. **316**, 323, 53-D14 (1987)
- HARTMANN, DIETER. FY Aquilae and the Gamma-Ray Burst Event of 1979 March 31. *Dieter Hartmann and Richard W. Pogge*. **318**, 363, 82-G4 (1987)
- HARTMANN, L. Mass Loss from FU Orionis Objects. *Ken Crowell, L. Hartmann, and E. H. Auer*. **312**, 227, 3-D6 (1987)
- Further Evidence for Disk Accretion in FU Orionis Objects. *L. Hartmann and S. J. Kenyon*. **312**, 243, 3-E8 (1987)
- Periodic Photospheric and Chromospheric Modulation in Alpha Orionis (Betelgeuse). *A. K. Dupree, S. L. Baliunas, E. F. Guinan, L. Hartmann, G. E. Nassiopoulou, and G. Sonneborn*. **317**, L86, 78-D4 (1987)
- High Spectral Resolution Infrared Observations of V1057 Cygni. *L. Hartmann and S. J. Kenyon*. **322**, 393, 142-B6 (1987)
- Spectral Energy Distributions of T Tauri Stars: Disk Flaring and Limits on Accretion. *S. J. Kenyon and L. Hartmann*. **323**, 714, 162-E3 (1987)
- HARTMANN, LEE. Radiative Bow Shock Models of Herbig-Haro Objects. *Patrick Hartigan, John Raymond, and Lee Hartmann*. **316**, 323, 53-D14 (1987)
- HARTMANN, LEE W. The Distribution of Rotational Velocities for Low-Mass Stars in the Pleiades. *John R. Stauffer and Lee W. Hartmann*. **318**, 337, 82-E5 (1987)
- Rotational Velocities of Low-Mass Stars in the Hyades. *John R. Stauffer, Lee W. Hartmann, and David W. Latham*. **320**, L51, 114-D12 (1987)
- HARTQUIST, T. W. The Effects of Dust on the Propagation and Dissipation of Alfvén Waves in Interstellar Clouds. *W. Philipp, T. W. Hartquist, O. Havnes, and G. E. Morfill*. **314**, 341, 37-G9 (1987)
- HARTWICK, F. D. A. The Space Distribution of Faint Quasars from the CFHT Survey. *David Crampton, A. P. Cowley, and F. D. A. Hartwick*. **314**, 129, 29-D4 (1987)
- Kinematics and Age of the Low-Mass X-Ray Binaries. *A. P. Cowley, J. B. Hutchings, David Crampton, and F. D. A. Hartwick*. **320**, 296, 111-C11 (1987)
- A Search for Primeval Galaxies Using a Narrow-Band Imaging Technique. *C. J. Pritchett and F. D. A. Hartwick*. **320**, 464, 114-E2 (1987)
- HARVEY, K. L. Microflares in the Solar Magnetic Network. *J. G. Porter, R. L. Moore, E. J. Reichmann, E. Engvold, and K. L. Harvey*. **323**, 380, 157-C5 (1987)
- HARVEY, P. M. A Near-Infrared Study of the NGC 6334-IV Region. *P. M. Harvey, A. R. Hyland, and S. M. Straw*. **317**, 173, 65-G8 (1987)
- Far-Infrared Continuum Emission from the Nucleus, Starburst, and Extended Spiral Arms of NGC 1068. *D. F. Lester, M. Joy, P. M. Harvey, H. B. Ellis, Jr., and P. S. Parmar*. **321**, 755, 132-G1 (1987)
- The 2 Micron Spectrum of L1551 IRS 5. *John S. Carr, P. M. Harvey, and D. F. Lester*. **321**, L71, 129-G7 (1987)
- HARVEY, PAUL M. Molecular Clouds in the Outer Galaxy. I. Far-Infrared Observations. *Kathryn N. Mead, Marc L. Kutner, Neal J. Evans II, Paul M. Harvey, and Bruce A. Wilking*. **312**, 321, 4-D4 (1987)
- An Active Star Formation Site in RCW 108. *Steven Straw, A. R. Hyland, Terry J. Jones, Paul M. Harvey, Bruce A. Wilking, and Marshall Joy*. **314**, 283, 31-B12 (1987)
- A Near-Infrared Study of the Luminous Merging Galaxies NGC 2623 and Arp 148. *Marshall Joy and Paul M. Harvey*. **315**, 480, 46-A4 (1987)
- Far-Infrared Detection of a Circumstellar Dust Torus around Sharpless 106. *Paul M. Harvey, Daniel F. Lester, and Marshall Joy*. **316**, L75, 62-C5 (1987)
- Infrared Emission from Young Stars in the Nucleus of M82. *Marshall Joy, Daniel F. Lester, and Paul M. Harvey*. **319**, 314, 96-D5 (1987)
- HARWIT, M. The Most Luminous Far-Infrared Extragalactic Sources. *M. Harwit, J. R. Houck, B. T. Soifer, and G. G. C. Palumbo*. **315**, 28, 40-C6 (1987)
- HASCHICK, A. D. The Leo Triplet Spiral Galaxy NGC 3628. I. VLA Observations of the Neutral Hydrogen Absorption. *J. T. Schmelz, W. A. Baan, and A. D. Haschick*. **315**, 492, 46-B3 (1987)
- The Leo Triplet Spiral Galaxy NGC 3628. II. VLA Observations of the Hydroxyl Absorption. *J. T. Schmelz, W. A. Baan, and A. D. Haschick*. **320**, 145, 109-E11 (1987)
- The Megamaser Galaxy Markarian 273. I. VLA Observations of the Hydroxyl Emission. *J. T. Schmelz, W. A. Baan, and A. D. Haschick*. **321**, 225, 124-F6 (1987)
- HASCHICK, AUBREY D. The 18 Centimeter OH Emission of IC 4553 (Arp 220). *Willem A. Baan and Aubrey D. Haschick*. **318**, 139, 80-D10 (1987)
- Temperature and Density Structure of the Collapsing Core of G10.6 - 0.4. *Eric R. Keto, Paul T. P. Ho, and Aubrey D. Haschick*. **318**, 712, 88-F8 (1987)
- Zw 15107 + 0724 and the Family of OH Megamasers. *Willem A. Baan, Christian Henkel, and Aubrey D. Haschick*. **320**, 154, 109-F6 (1987)

- HASEGAWA, T. The Bright-Rimmed Molecular Cloud around S140 IRS. II. Bipolar Outflow from S140 IRS 1. *M. Hayashi, T. Hasegawa, T. Omodaka, S. S. Hayashi, and R. Miyawaki.* **312**, 327, 4-D10 (1987)
- Small-Scale Structure and Chemical Differential in the Central Regions of the Sagittarius B2 Molecular Cloud. *Paul F. Goldsmith, Ronald L. Snell, T. Hasegawa, and N. Ukita.* **314**, 525, 35-C6 (1987)
- HASEGAWA, TETSUO. Fluorescent Molecular Hydrogen Emission from the Reflection Nebula NGC 2023. *Ian Gatley, Tetsuo Hasegawa, Hiroko Suzuki, Ron Garden, Peter Brand, John Lightfoot, William Glencross, Haruyuki Okuda, and Tetsuya Nagata.* **318**, L73, 92-D4 (1987)
- Level Population and Para/Ortho Ratio of Fluorescent H_2 in NGC 2023. *Tetsuo Hasegawa, Ian Gatley, Ron P. Garden, Peter W. J. L. Brand, Masatoshi Ohishi, Masahiko Hayashi, and Norio Kaifu.* **318**, L77, 92-D12 (1987)
- HASHIMOTO, O. Water Maser Emission toward V788 Cygni, A Carbon Star. *Y. Nakada, H. Izumiura, T. Onaka, O. Hashimoto, N. Ukita, S. Deguchi, and T. Tanabé.* **323**, L77, 158-F6 (1987)
- HASINGER, G. The Complex Cross-Spectra of Cygnus X-2 and GX 5-1. *M. van der Klis, G. Hasinger, L. Stella, A. Langmeier, J. van Paradijs, and W. H. G. Lewin.* **319**, L13, 100-B2 (1987)
- EXOSAT Observations of 4U 1705 - 44: Type I Bursts and Persistent Emission. *A. Langmeier, M. Sztajno, G. Hasinger, J. Trümper, and M. Gottwald.* **323**, 288, 156-B13 (1987)
- HATZES, ARTIE P. Doppler Images of Rotating Stars Using Maximum Entropy Image Reconstruction. *Steven S. Vogt, G. Donald Penrod, and Artie P. Hatzes.* **321**, 496, 127-E5 (1987)
- HAUSER, M. G. Physical Processes and Infrared Emission from the Cassiopeia A Supernova Remnant. *E. Dwek, H. L. Dinerstein, F. C. Gillett, M. G. Hauser, and W. L. Rice.* **315**, 571, 47-A1 (1987)
- Large-Scale Galactic Dust Morphology and Physical Conditions from IRAS Observations. *T. J. Sodoroski, E. Dwek, M. G. Hauser, and F. J. Kerr.* **322**, 101, 139-A10 (1987)
- HAVNES, O. The Effects of Dust on the Propagation and Dissipation of Alfvén Waves in Interstellar Clouds. *W. Pilipp, T. W. Hartquist, O. Havnes, and G. E. Morfill.* **314**, 341, 37-G9 (1987)
- HAWKINS, ISABEL. The $^{12}C/^{13}C$ Isotope Ratio of the Interstellar Medium in the Neighborhood of the Sun. *Isabel Hawkins and Michael Jura.* **317**, 926, 76-C5 (1987)
- HAYAKAWA, S. see MAKINO, F., et al.
- HAYAKAWA, S. Spectra and Pulse Period of the Binary X-Ray Pulsar 4U 1538 - 52. *K. Makishima, K. Koyama, S. Hayakawa, and F. Nagase.* **314**, 619, 36-C10 (1987)
- HAYASHI, CHUSHIRO. The Equilibria of Rotating Isothermal Clouds. *Masayoshi Kiguchi, Shinji Narita, Shoken M. Miyama, and Chushiro Hayashi.* **317**, 830, 75-B5 (1987)
- HAYASHI, M. The Bright-Rimmed Molecular Cloud around S140 IRS. II. Bipolar Outflow from S140 IRS 1. *M. Hayashi, T. Hasegawa, T. Omodaka, S. S. Hayashi, and R. Miyawaki.* **312**, 327, 4-D10 (1987)
- HAYASHI, MASAHIKO. Level Population and Para/Ortho Ratio of Fluorescent H_2 in NGC 2023. *Tetsuo Hasegawa, Ian Gatley, Ron P. Garden, Peter W. J. L. Brand, Masatoshi Ohishi, Masahiko Hayashi, and Norio Kaifu.* **318**, L77, 92-D12 (1987)
- HAYASHI, S. S. The Bright-Rimmed Molecular Cloud around S140 IRS. II. Bipolar Outflow from S140 IRS 1. *M. Hayashi, T. Hasegawa, T. Omodaka, S. S. Hayashi, and R. Miyawaki.* **312**, 327, 4-D10 (1987)
- HAYES, MARION. SMM Observations of Si IV and O IV Bursts in Solar Active Regions. *Marion Hayes and R. A. Shine.* **312**, 943, 13-C6 (1987)
- HAZARD, C. The Remarkable Broad Absorption Line QSO 0059 - 2735 with Extensive Fe II Absorption. *C. Hazard, Richard G. McMahon, John K. Webb, and Donald C. Morton.* **323**, 263, 156-A1 (1987)
- HEAP, SARA R. Mass Distribution and Evolutionary Scheme for Central Stars of Planetary Nebulae. *Sara R. Heap and Harry J. Augensen.* **313**, 268, 17-G10 (1987)
- HEATH, J. R. Long Carbon Chain Molecules in Circumstellar Shells. *H. W. Kroto, J. R. Heath, S. C. O'Brien, R. F. Curl, and R. E. Smalley.* **314**, 352, 32-A9 (1987)
- HEATHCOTE, S. IRAS 18059 - 3211: Optically Known As Gomez's Hamburger: Erratum. *M. T. Ruiz, V. Blanco, J. Maza, S. Heathcote, A. Phillips, K. Kawara, C. Anguita, M. Hamuy, and A. Gomez.* **320**, L157, 121-F14 (1987) (Orig. paper in **316**, L21, 56-B10)
- HEATHCOTE, S. R. Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. *V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storch-Bergmann, and J. Matthews.* **320**, 589, 116-B3 (1987)
- HEATHCOTE, STEVE. IRAS 1809 - 3211: Optically Known as "Gomez's Hamburger". *Maria Teresa Ruiz, Victor Blanco, José Maza, Steve Heathcote, Andrew Phillips, Kimiaki Kawara, Claudio Anguita, Mario Hamuy, and Arturo Gómez.* **316**, L21, 56-B10 (1987)
- HEBDEN, JEREMY C. The Ha Chromosphere of Alpha Orionis. *Jeremy C. Hebdén, Andreas Eckart, and E. Keith Hege.* **314**, 690, 37-B10 (1987)
- HECHT, J. H. A Physical Model for the 2175 Å Interstellar Extinction Feature: Erratum. *J. H. Hecht.* **314**, 429, 32-G9 (1987) (Orig. paper in **305**, 817, 77-G6)
- HECKERT, PAUL A. Optical and Near-Infrared Observations of BL Lacertae Objects and Active Quasars. *Paul S. Smith, Thomas J. Balonek, Richard Elston, and Paul A. Heckert.* **64**, 459, 22-G9 (1987) (Abstr. in **316**, 860, 61-E2)
- HEGE, E. KEITH. The Ha Chromosphere of Alpha Orionis. *Jeremy C. Hebdén, Andreas Eckart, and E. Keith Hege.* **314**, 690, 37-B10 (1987)
- Chromospheric Activity and Ages of Solar-Type Stars. *Don C. Barry, Richard H. Cromwell, and E. Keith Hege.* **315**, 264, 42-G5 (1987)
- HEILES, CARL. A New Assault on the 92 Centimeter Line of D I. *Leo Blitz and Carl Heiles.* **313**, L95, 27-E9 (1987)
- Supernovae versus Models of the Interstellar Medium and the Gaseous Halo. *Carl Heiles.* **315**, 555, 46-F10 (1987)
- HEILIGMAN, GARY M. Molecular Gas Within 2° of the Galactic Center. I. Survey of ^{13}CO Emission. *Gary M. Heiligman.* **314**, 747, 37-G1 (1987)
- HEINBACH, U. Antiproton Production of Propagating Cosmic Rays under Distributed Reacceleration. *Manfred Simon, U. Heinbach, and Ch. Koch.* **320**, 699, 117-D6 (1987)
- HEINTZ, W. D. Micrometer Observations of Double Stars and New Pairs. XIII. *W. D. Heintz.* **65**, 161, 29-E11 (1987) (Abstr. in **319**, 1013, 106-A11)
- HEISE, J. Determination of Photospheric Helium Abundances for the Hot White Dwarfs LB 1663 and CD - 38°10980 from EXOSAT Soft X-Ray Photometry. *F. B. S. Paerels, J. Heise, S. M. Kahn, and R. D. Rogers.* **322**, 315, 141-C6 (1987)
- HEITHAUSEN, ANDREAS. Molecular and Atomic Clouds Associated with Infrared Cirrus in Ursa Major. *Hendrik Willem de Vries, Andreas Heithausen, and Patrick Thaddeus.* **319**, 723, 103-A1 (1987)
- HELFAND, D. J. G0.9 + 0.1 and the Emerging Class of Composite Supernova Remnants. *D. J. Helfand and R. H. Becker.* **314**, 203, 30-C10 (1987)
- VLA Observations of the Fast Pulsar Candidate in M28. *W. C. Erickson, M. J. Mahoney, R. H. Becker, and D. J. Helfand.* **314**, L45, 39-B9 (1987)
- High-Resolution Radio Observations of the Supernova Remnant G24.7 + 0.6 and the Discovery of an Ultracompact H II Region. *R. H. Becker and D. J. Helfand.* **316**, 660, 59-C10 (1987)
- The Origin of the Diffuse X-Ray Background. *T. T. Hamilton and D. J. Helfand.* **318**, 93, 80-A1 (1987)
- X-Ray Observations of the Supernova Remnant N103B in the Large Magellanic Cloud. *K. P. Singh, N. J. Westergaard, H. W. Schnopper, and D. J. Helfand.* **322**, 80, 138-G3 (1987)
- HELLINGS, R. W. Inhomogeneous Cosmology. III. Primordial Gravitational Waves and Dust. *P. J. Adams, R. W. Hellings, and R. L. Zimmerman.* **318**, 1, 79-A5 (1987)
- HELOU, GEORGE. On the Origin of the 40-120 Micron Emission of Galaxy Disks: A Comparison with H α Fluxes. *Carol J. Lonsdale Persson and George Helou.* **314**, 513, 35-B8 (1987)
- Arecibo Observations of IRAS Galaxies at 21 and 18 Centimeters Wavelengths. *Robert W. Garwood, George Helou, and John M. Dickey.* **322**, 88, 138-G11 (1987)
- H I Detection Survey of a Complete Magnitude-limited Sample of Dwarf Irregular Galaxies in the Virgo Cluster Area. *G. Lyle Hoffman, George Helou, E. E. Salpeter, John Glosson, and A. Sandage.* **63**, 247, 4-A5 (1987) (Abstr. in **312**, 964, 13-E5)
- HENKEL, CHRISTIAN. Zw 15107 + 0724 and the Family of OH Megamasers. *Willem A. Baan, Christian Henkel, and Aubrey D. Haschick.* **320**, 154, 109-F6 (1987)
- H $_2O$ Maser Emission from the Nuclei of NGC 253 and M51. *Paul T. P. Ho, Robert N. Martin, Christian Henkel, and Jean L. Turner.* **320**, 663, 117-A12 (1987)
- Galactic Center Molecular Clouds. I. Spatial and Spatial-Velocity Maps. *John Bally, Antony A. Stark, Robert W. Wilson, and Christian Henkel.* **65**, 13, 28-B2 (1987) (Abstr. in **319**, 1011, 106-A9)
- HENNING, PATRICIA A. Searching at 21 Centimeters for Galaxies behind the Milky Way. *Frank J. Kerr and Patricia A. Henning.* **320**, L99, 121-C2 (1987)
- HENNRICH, H. F. Recurrent Episodic Mass Loss in a B2e Star: 66 Ophiuchi, 1982-1985. *C. A. Grady, George Sonneborn, Chi-Chao Wu, and H. F. Henrichs.* **65**, 673, 39-A2 (1987) (Abstr. in **322**, 1077, 151-G3)
- HENNRICH, HUIB F. Ultraviolet Observations of Extensive Variability in the Stellar Wind of ξ Persei. *Raman K. Prinja, Ian D. Howarth, and Hui F. Henrichs.* **317**, 389, 68-B11 (1987)
- HENRIKSEN, M. Are the Virial Masses of Clusters Smaller Than We Think? *L. L. Cowie, M. Henriksen, and R. Mushotzky.* **317**, 593, 72-E11 (1987)

- HENRIKSEN, R. N. Anisotropic Radiation Fields Produced by Scattering in Thick Accretion Disks. *J. Madej, C. Loken, and R. N. Henriksen.* **312**, 652, 10-A13 (1987)
- Jet Collimation by Turbulent Viscosity. *I. R. N. Henriksen.* **314**, 33, 28-D1 (1987)
- HENRY, J. PATRICK. Multiaperture Spectroscopy of Galaxies in Abell 370. *J. Patrick Henry and Russell J. Lavery.* **323**, 473, 159-F9 (1987)
- HENRY, J. W. Effective Collision Strengths for Electron Impact Excitation in S II. *S. S. Tayal, J. W. Henry, and S. Nakazaki.* **313**, 487, 20-C10 (1987)
- HENRY, R. C. IUE Observations of Hydrogen and Deuterium in the Local Interstellar Medium. *J. Murthy, R. C. Henry, H. W. Moos, W. B. Landsman, J. L. Linsky, A. Vidal-Madjar, and C. Gry.* **315**, 675, 48-A10 (1987)
- HENRY, RICHARD B. C. Predicted [Ni II] Infrared Line Strengths in the Crab Nebula and IC 443. *Richard B. C. Henry.* **322**, 399, 142-B12 (1987)
- HENRY, RONALD J. W. Electron Excitation of Fine-Structure Transitions within the Ground $3s^2 3p^3$ Configuration in Fe XII. *S. S. Tayal, Ronald J. W. Henry, and A. K. Pradhan.* **319**, 951, 105-C13 (1987)
- HENRY, T. J. Direct Infrared Observations of the Very Low Mass Object Gliese 623B. *D. W. McCarthy, Jr. and T. J. Henry.* **319**, L93, 107-F3 (1987)
- HENSON, G. D. Discovery of Optical Circular Polarization in Lambda Andromedae. *J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook.* **317**, L29, 71-C2 (1987)
- HERBST, ERIC. Ion-Molecule Calculation of the Abundance Ratio of CCD to CCH in Dense Interstellar Clouds. *Eric Herbst, Nigel G. Adams, David Smith, and D. J. DeFrees.* **312**, 351, 4-F7 (1987)
- Can Gas Phase Reactions Produce Complex Oxygen-containing Molecules in Dense Interstellar Clouds? A Revision of Some Important Radiative Association Rate Coefficients. *Eric Herbst.* **313**, 867, 26-C4 (1987)
- C-Type Transitions in Methyl Formate. *Grant M. Plummer, Eric Herbst, and Frank C. De Lucia.* **318**, 873, 90-E3 (1987)
- A Detailed Investigation of Proposed Gas-Phase Syntheses of Ammonia in Dense Interstellar Clouds. *Eric Herbst, D. J. DeFrees, and A. D. McLean.* **321**, 898, 134-D4 (1987)
- The Laboratory Millimeter- and Submillimeter-Wave Spectrum of ^{13}C Methanol. *Todd Anderson, Eric Herbst, and Frank C. De Lucia.* **64**, 703, 27-E4 (1987) (Abstr. in **318**, 946, 91-C11)
- HERBST, W. Shock-Front Compression of the Magnetic Field in the Canis Major R1 Star Formation Region. *F. J. Vrba, R. Baierlein, and W. Herbst.* **317**, 207, 66-C4 (1987)
- HERISTCHI, D. Proton-Electron Bremsstrahlung Polarization: Solar Flare X-Ray and Gamma-Ray Polarization. *D. Heristchi.* **323**, 391, 157-D2 (1987)
- HERNQUIST, LARS. Shells and Dark Matter in Elliptical Galaxies. *Lars Hernquist and P. J. Quinn.* **312**, 1, 1-A7 (1987)
- Shell Galaxies and Alternatives to the Dark Matter Hypothesis. *Lars Hernquist and P. J. Quinn.* **312**, 17, 1-B9 (1987)
- Performance Characteristics of Tree Codes. *Lars Hernquist.* **64**, 715, 27-F2 (1987) (Abstr. in **318**, 946, 91-C11)
- HERRERA, L. Propagation of a Shock Wave in a Radiating Spherically Symmetric Distribution of Matter. *L. Herrera and L. Núñez.* **319**, 868, 104-D11 (1987)
- HERSHKOWITZ, STEPHEN. Spectral Flux from Low-Density Photospheres: Low-Temperature Results. *Stephen Hershkowitz and Robert V. Wagoner.* **322**, 967, 150-D11 (1987)
- HERTZ, PAUL. An 8.5 Hour X-Ray Period in the M15 X-Ray Source 4U 2129 + 12. *Paul Hertz.* **315**, L119, 49-D14 (1987)
- CCD Photometry of Globular Cluster Core Structure. I. NGC 6388, NGC 6624, and M15—One Flat Core and Two Cusps. *Phyllis M. Lugger, Haldan Cohn, Jonathan E. Grindlay, Charles D. Bailyn, and Paul Hertz.* **320**, 482, 114-F8 (1987)
- Search for X-Ray Emission from the Radio Lobes of Scorpius X-1. *Barry Geldzahler and Paul Hertz.* **322**, 342, 141-E5 (1987)
- HESSMAN, FREDERIC V. The Exotic Helium Variable PG 1346 + 082. *M. A. Wood, D. E. Winget, R. E. Nather, Frederic V. Hessman, James Liebert, Donald W. Kurtz, F. Wesemael, and G. Wegner.* **313**, 757, 25-B1 (1987)
- HESTER, J. JEFF. A Sheet Description of the Emission from Middle-aged Supernova Remnants. *J. Jeff Hester.* **314**, 187, 30-A8 (1987)
- HEWITT, A. A New Optical Catalog of Quasi-stellar Objects. *A. Hewitt and G. Burbidge.* **63**, 1, 1-A5 (1987) (Abstr. in **311**, 1076, 160-E12)
- HEWITT, J. N. The Triple Radio Source 0023 + 171: A Candidate for a Dark Gravitational Lens. *J. N. Hewitt, E. L. Turner, C. R. Lawrence, D. P. Schneider, J. E. Gunn, C. L. Bennett, B. F. Burke, J. H. Mahoney, G. I. Langston, M. Schmidt, J. B. Oke, and J. G. Hoessel.* **321**, 706, 132-C5 (1987)
- HEYER, INGEBORG. Forbidden Line and H α Profiles in T Tauri Star Spectra: A Probe of Anisotropic Mass Outflows and Circumstellar Disks. *Suzan Edwards, Sylvie Cabrit, Stephen E. Strom, Ingeborg Heyer, Karen M. Strom, and E. Anderson.* **321**, 473, 127-C10 (1987)
- HEYER, MARK H. A Survey of IRAS Point Sources in Taurus for High-Velocity Molecular Gas. *Mark H. Heyer, Ronald L. Snell, Paul F. Goldsmith, and Philip C. Myers.* **321**, 370, 126-C3 (1987)
- The Magnetic Evolution of the Taurus Molecular Clouds. I. Large-scale Properties. *Mark H. Heyer, Frederick J. Vrba, Ronald L. Snell, F. P. Schloerb, Stephen E. Strom, Paul F. Goldsmith, and Karen M. Strom.* **321**, 855, 133-G9 (1987)
- HICKSON, PAUL. Imaging Spectroscopy of Five QSOs. *Paul Hickson and J. B. Hutchings.* **312**, 518, 8-E6 (1987)
- HIGDON, J. C. Gamma-Ray Constraints on ^{22}Na Yields in Nova Explosions. *J. C. Higdon and William A. Fowler.* **317**, 710, 73-G2 (1987)
- HILL, G. J. The Reddening of Cygnus A from a Measurement of Paschen-Alpha. *S. J. Lilly and G. J. Hill.* **315**, L103, 49-C12 (1987)
- IRAS 23060 + 0505: A Highly Obscured $3.3 \times 10^{12} L_{\odot}$ Active Galaxy. *G. J. Hill, C. G. Wynn-Williams, and E. E. Becklin.* **316**, L11, 56-A14 (1987)
- HILL, G. M. Interdependence of the 4430 Å Diffuse Interstellar Band, Polarization, and Ultraviolet Extinction. *J. Krelowski, G. A. H. Walker, G. R. Grieve, and G. M. Hill.* **316**, 449, 55-A3 (1987)
- HILL, J. ALLEN. Detection of Superhumps and Quasi-periodic Oscillations in the Light Curve of the Dwarf Nova SW Ursae Majoris. *Edward L. Robinson, Allen W. Shafter, J. Allen Hill, Matt A. Wood, and Janet A. Mattei.* **313**, 772, 25-C2 (1987)
- Two Extreme Examples of Compact Pulsars: PG 1115 + 158 and PG 1351 + 489. *D. E. Winget, R. E. Nather, and J. Allen Hill.* **316**, 305, 53-C11 (1987)
- HILL, ROBERT S. Vacuum Ultraviolet Images of the Large Magellanic Cloud. *Andrew M. Smith, Robert M. Cornett, and Robert S. Hill.* **320**, 609, 116-C9 (1987)
- HILLEBRANDT, WOLFGANG. The Production of ^{26}Al in Supermassive Stars and the Gamma-Ray Line Flux from the Galactic Center. *Wolfgang Hillebrandt, Friedrich-Karl Thielemann, and Norbert Langer.* **321**, 761, 132-G7 (1987)
- HILLIER, D. J. Modeling the Extended Atmospheres of WN Stars. *D. J. Hillier.* **63**, 947, 15-F8 (1987) (Abstr. in **314**, 833, 38-F9)
- An Empirical Model for the Wolf-Rayet Star HD 50896. *D. J. Hillier.* **63**, 965, 15-G12 (1987) (Abstr. in **314**, 833, 38-F9)
- HILLS, J. G. Three-dimensional Hydrodynamical Simulations of Stellar Collisions. I. Equal-Mass Main-Sequence Stars. *W. Benz and J. G. Hills.* **323**, 614, 161-D9 (1987)
- HINKLE, K. H. Velocity Structure of Stellar Atmospheres: R Scuti. *David Mozurkewich, R. D. Gehrz, K. H. Hinkle, and D. L. Lambert.* **314**, 242, 30-F12 (1987)
- HINKLE, KENNETH H. Two Micron CO Absorption Lines in the Spectrum of Epsilon Aurigae during Eclipse. *Kenneth H. Hinkle and Theodore Simon.* **315**, 296, 43-B9 (1987)
- Oxygen Isotopic Abundances in Evolved Stars. III. 26 Carbon Stars. *Michael J. Harris, David L. Lambert, Kenneth H. Hinkle, Bengt Gustafsson, and Kjell Eriksson.* **316**, 294, 53-B14 (1987)
- HINSHAW, GARY. Gravitational Lensing by Isothermal Spheres with Finite Core Radii: Galaxies and Dark Matter. *Gary Hinshaw and Lawrence M. Krauss.* **320**, 468, 114-E7 (1987)
- HINTON, RICHARD W. Large Negative ^{50}Ti Anomalies in Refractory Inclusions from the Murchison Carbonaceous Chondrite: Evidence for Incomplete Mixing of Neutron-rich Supernova Ejecta into the Solar System. *Richard W. Hinton, Andrew M. Davis, and Debra E. Scatena-Wachel.* **313**, 420, 19-E12 (1987)
- HIROMOTO, N. see MAKINO, F., et al.
- HJELLMING, MICHAEL S. Thresholds for Rapid Mass Transfer in Binary System. I. Polytopic Models. *Michael S. Hjellming and Ronald F. Webbink.* **318**, 794, 89-E10 (1987)
- HO, CHENG. High-Luminosity Accretion in Wind-driven Binary X-Ray Sources. *Cheng Ho and Jonathan Arons.* **316**, 283, 53-B3 (1987)
- Fluctuation of Wind-driven Accretion in X-Ray Binaries. *Cheng Ho and Jonathan Arons.* **321**, 404, 126-E11 (1987)
- HO, PAUL T. P. Recombination Spectroscopy of Star-Formation Regions in the Nucleus of M83. *Jean L. Turner, Paul T. P. Ho, and Sara C. Beck.* **313**, 644, 23-G2 (1987)
- Temperature and Density Structure of the Collapsing Core of G10.6 - 0.4. *Eric R. Keto, Paul T. P. Ho, and Aubrey D. Haschick.* **318**, 712, 88-F8 (1987)
- H $_2$ O Maser Emission from the Nuclei of NGC 253 and M51. *Paul T. P. Ho, Robert N. Martin, Christian Henkel, and Jean L. Turner.* **320**, 663, 117-A12 (1987)
- Interaction of the High-Density Gas with the Bipolar Outflow in Cepheus A. *José M. Torrelles, Paul T. P. Ho, Luis F. Rodríguez, Jorge Cantó, and James M. Moran.* **321**, 884, 134-C4 (1987)

- Hot Gas in the Nucleus of IC 342: Detection of $J = 3-2$ CO Emission. Paul T. P. Ho, Jean L. Turner, and Robert N. Martin. **322**, L67, L52-B3 (1987)
- Gravitational Collapse in Molecular Cloud Cores around Ultracompact H II Regions: Two Candidates. Eric R. Keto, Paul T. P. Ho, and Mark J. Reid. **323**, L117, L64-C1 (1987)
- HOBBS, L. M. The Lithium Abundance in Halo Stars. L. M. Hobbs and Douglas K. Duncan. **317**, 796, 74-F10 (1987)
- HODAPP, KLAUS-WERNER. The Magnetic Field in Star-forming Large Globules. Klaus-Werner Hodapp. **319**, 842, 104-B13 (1987)
- HODGE, P. W. Giant H II Regions in M81. Michele Kaufman, Frank N. Bash, R. C. Kennicutt, Jr., and P. W. Hodge. **319**, 61, 93-F7 (1987)
- HODGE, PAUL. CCD Photometry of Large Magellanic Cloud Clusters. IV. The Metal-rich, Remote Southern Cluster LW 79. Mario Mateo and Paul Hodge. **320**, 626, 116-D14 (1987)
- HODGE, W. L. A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengtson, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan. **313**, 920, 26-G3 (1987)
- Laboratory Study of the Spectrum of Highly Ionized Calcium in the 100-250 Å Range Applied to Solar Flare Diagnostics. S. Lippmann, M. Finkenthal, L. K. Huang, H. W. Moos, B. C. Stratton, T. L. Yu, A. K. Bhatia, and W. L. Hodge. **316**, 819, 61-A11 (1987)
- HOEKSEMA, J. T. Rotation of the Coronal Magnetic Fields. J. T. Hoeksema and P. H. Scherrer. **318**, 428, 83-E12 (1987)
- HOESSEL, J. G. The Triple Radio Source 0023 + 171: A Candidate for a Dark Gravitational Lens. J. N. Hewitt, E. L. Turner, C. R. Lawrence, D. P. Schneider, J. E. Gunn, C. L. Bennett, B. F. Burke, J. H. Mahoney, G. I. Langston, M. Schmidt, J. B. Oke, and J. G. Hoessel. **321**, 706, 132-C5 (1987)
- HOFFMAN, G. LYLE. H I Detection Survey of a Complete Magnitude-limited Sample of Dwarf Irregular Galaxies in the Virgo Cluster Area. G. Lyle Hoffman, George Helou, E. E. Salpeter, John Glosson, and A. Sandage. **63**, 247, 4-A5 (1987) (Abstr. in **312**, 964, 13-E5)
- HOFFMAN, Y. The Effects of Neutrino Transport on the Collapse of Iron Stellar Cores. E. S. Myra, S. A. Bludman, Y. Hoffman, I. Lichenstadt, N. Sack, and K. A. Van Riper. **318**, 744, 89-B2 (1987)
- HOFFMAN, YEHUDA. Normalization, Cold Dark Matter, and Large-Scale Velocities. Yehuda Hoffman. **318**, L7, 85-A9 (1987)
- HOFFMANN, W. F. Structure in the Nucleus of NGC 1068 at 10 Microns. R. Tresch-Fienberg, G. G. Fazio, D. Y. Gezari, W. F. Hoffmann, G. M. Lamb, P. K. Shu, and C. R. McCreight. **312**, 542, 8-G2 (1987)
- HOGAN, CRAIG J. On the Physical State of QSO Lyman- α Absorption Clouds. Craig J. Hogan. **316**, L59, 62-B5 (1987)
- HOHENBERG, C. M. Evidence in Meteorites for an Active Early Sun. M. W. Caffee, C. M. Hohenberg, T. D. Swindle, and J. N. Goswami. **313**, L31, 21-C3 (1987)
- HOLBERG, J. B. Further Observations of the Peculiar Hot Helium-rich Degenerate KPD 0005 + 5106. Ronald A. Downes, Edward M. Sion, James Liebert, and J. B. Holberg. **321**, 943, 134-G7 (1987)
- HOLLENBACH, D. J. Shock Processing of Interstellar Dust: Diamonds in the Sky. A. G. G. M. Tielens, C. G. Seab, D. J. Hollenbach, and Christopher F. McKee. **319**, L109, 107-G6 (1987)
- HOLLENBACH, DAVID J. The Structure of Time-dependent Interstellar Shocks and Grain Destruction in the Interstellar Medium. Christopher F. McKee, David J. Hollenbach, C. Gregory Seab, and A. G. G. M. Tielens. **318**, 674, 88-C7 (1987)
- Radio Recombination Lines from Fast Shocks in Molecular Clouds, with Application to Bipolar Flows. Christopher F. McKee and David J. Hollenbach. **322**, 275, 140-G7 (1987)
- HOLLIS, J. M. The Large-Scale Radio Structure of R Aquarii. J. M. Hollis, M. Kafatos, A. G. Michalitsianos, R. J. Oliveren, and F. Yusef-Zadeh. **321**, L55, 129-F6 (1987)
- A Palomar Observatory Sky Survey Atlas of Selected Molecular Clouds. D. A. Klingensmith and J. M. Hollis. **64**, 127, 18-F5 (1987) (Abstr. in **315**, 731, 48-E12)
- HOLLWEG, JOSEPH V. Resonance Absorption of Magnetohydrodynamic Surface Waves: Physical Discussion. Joseph V. Hollweg. **312**, 880, 12-E4 (1987)
- Incompressible Magnetohydrodynamic Surface Waves: Nonlinear Aspects. Joseph V. Hollweg. **317**, 918, 76-B11 (1987)
- Resonance Absorption of Magnetohydrodynamic Surface Waves: Viscous Effects. Joseph V. Hollweg. **320**, 875, 119-D2 (1987)
- HOLMAN, G. D. The Plasma and Magnetic Field Properties of Coronal Loops Observed at High Spatial Resolution. D. F. Webb, G. D. Holman, J. M. Davis, M. R. Kundu, and R. K. Shevgaonkar. **315**, 716, 48-D11 (1987)
- HOLT, S. S. Search for Orbital X-Ray Variation in Scorpius X-1. W. C. Friedhorsky and S. S. Holt. **312**, 743, 11-A13 (1987)
- HONDA, M. A Simulation of High-Energy Cosmic-Ray Propagation. M. Honda. **319**, 836, 104-B7 (1987)
- HONEYCUTT, R. KENT. Time-resolved Spectrophotometry of the Cataclysmic Variable EX Hydrae. Ronald H. Kaitchuck, Panayiotis A. Hantzios, Panagiotis Kakaletis, R. Kent Honeycutt, and Eric M. Schlegel. **317**, 765, 74-D3 (1987)
- Atlas of Time-resolved Spectrophotometry of Cataclysmic Variables. R. Kent Honeycutt, Ronald H. Kaitchuck, and Eric M. Schlegel. **65**, 451, 34-D4 (1987) (Abstr. in **321**, 1052, 136-A3)
- HONG, S. S. Inversion of the Zodiacal Infrared Brightness Integral. S. S. Hong and I. K. Um. **320**, 928, 120-A5 (1987)
- HORN, JIRI. An Eight-Year Spectroscopic Orbit for the WC7 + O4 Wolf-Rayet Binary HD 193793: Toward Solving the Mystery of the Infrared Outbursts. Anthony F. Moffat, Robert Lamontagne, Peredur M. Williams, Jiri Horn, and Wilhelm Seggewiss. **312**, 807, 11-F8 (1987)
- HOSHI, R. see MAKINO, F., et al.
- HOSHI, R. X-Ray Irradiated Accretion Disks and Bimodal States. H. Inoue and R. Hoshi. **322**, 320, 141-C11 (1987)
- HOTZ, HENRY B. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. John D. Anderson, Timothy P. Krisher, Susan E. Borutski, Michael J. Connolly, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen. **323**, L141, 164-E1 (1987)
- HOUCK, J. R. The Most Luminous Far-Infrared Extragalactic Sources. M. Harwit, J. R. Houck, B. T. Soifer, and G. G. C. Palumbo. **315**, 28, 40-C6 (1987)
- Far-Infrared Spectroscopy of Star Formation Regions in M82. P. B. Duffy, E. F. Erickson, M. R. Haas, and J. R. Houck. **315**, 68, 40-F6 (1987)
- A Very Deep IRAS Survey: Constraints on the Evolution of Starburst Galaxies. Perry Hacking, J. J. Condon, and J. R. Houck. **316**, L15, 56-B4 (1987)
- A Very Deep IRAS Survey at $l = 97^\circ$, $b = 30^\circ$. Perry Hacking and J. R. Houck. **63**, 311, 5-A3 (1987) (Abstr. in **312**, 965, 13-E6)
- HOUGH, D. H. Superluminal Motion in the Double-lobed Quasar 3C 245. D. H. Hough and A. C. S. Readhead. **321**, L11, 129-C1 (1987)
- HOUSE, LEWIS L. The Ejection of Helical Field Structures through the Outer Corona. Lewis L. House and Mitchell A. Berger. **323**, 406, 157-E4 (1987)
- HOVESTADT, D. Calculation of the Mean Equilibrium Charges of Energetic Ions after Passing through a Hot Plasma. A. Luhn and D. Hovestadt. **317**, 852, 75-D1 (1987)
- The Mean Ionic Charge of Silicon in ^3He -rich Solar Flares. A. Luhn, B. Klecker, D. Hovestadt, and E. Möbius. **317**, 951, 76-E2 (1987)
- A Multispacecraft Study of the Injection and Transport of Solar Energetic Particles. J. Beeck, G. M. Mason, D. C. Hamilton, G. Wibberenz, H. Kunow, D. Hovestadt, and B. Klecker. **322**, 1052, 151-D14 (1987)
- HOWARD, R. J. CO Emission from Centaurus A. T. G. Phillips, B. N. Ellison, J. B. Keene, R. B. Leighton, R. J. Howard, C. R. Masson, D. B. Sanders, B. Veidt, and K. Young. **322**, L73, 152-B8 (1987)
- HOWARD, W. M. Inverse Comptonization by One-dimensional Relativistic Electrons. E. Canfield, W. M. Howard, and E. P. Liang. **323**, 565, 161-A1 (1987)
- HOWARTH, IAN D. Ultraviolet Observations of Extensive Variability in the Stellar Wind of ξ Persei. Raman K. Prinja, Ian D. Howarth, and Huib F. Henrichs. **317**, 389, 68-B11 (1987)
- HOWELL, R. R. Milliarsecond Resolution Infrared Observations of Young Stars in Taurus and Ophiuchus. M. Simon, R. R. Howell, A. J. Longmore, B. A. Wilking, D. M. Peterson, and W.-P. Chen. **320**, 344, 111-G3 (1987)
- HRIVNAK, B. J. RW Comae Berenices. III. Light Curve Solution and Absolute Parameters. E. F. Milone, R. E. Wilson, and B. J. Hrivnak. **319**, 325, 96-E3 (1987)
- HRIVNAK, BRUCE J. Ground-based Observations of IRAS Candidates for Late Asymptotic Giant Branch Stars. Sun Kwok, Bruce J. Hrivnak, and R. T. Boreiko. **312**, 303, 4-B14 (1987)
- Ground-based Infrared Observations of Variable IRAS Sources as Candidates for Late Asymptotic Giant Branch Stars. Sun Kwok, Bruce J. Hrivnak, and R. T. Boreiko. **321**, 975, 135-B11 (1987)
- HU, ESTHER M. The Distribution of Gas and Galaxies around the Distant Quasar PKS 1614 + 051. Esther M. Hu and Lennox L. Cowie. **317**, L7, 71-A9 (1987)
- The Formation of Families of Twin Galaxies By String Loops. Lennox L. Cowie and Esther M. Hu. **318**, L33, 92-A9 (1987)
- HUA, X.-M. A Determination of the $^3\text{He}/\text{H}$ Ratio in the Solar Photo-

- sphere from Flare Gamma-Ray Line Observations. *X.-M. Hua and R. E. Lingenfelter*. **319**, 555, 99-C14 (1987)
- Solar Flare Neutron and Accelerated Ion Angular Distributions. *X.-M. Hua and R. E. Lingenfelter*. **323**, 779, 163-C8 (1987)
- HUANG, L. K. A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. *M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengtson, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan*. **313**, 920, 26-G3 (1987)
- Laboratory Study of the Spectrum of Highly Ionized Calcium in the 100–250 Å Range Applied to Solar Flare Diagnostics. *S. Lippmann, M. Finkenthal, L. K. Huang, H. W. Moos, B. C. Stratton, T. L. Yu, A. K. Bhatia, and W. L. Hodge*. **316**, 819, 61-A11 (1987)
- HUANG, T. S. Centrifugal Field Line Breaking: An Upper Limit to Io Mass Injection. *T. S. Huang and G. L. Siscoe*. **312**, 475, 6-B1 (1987)
- Corotation Lag Limit on Mass-Loss Rate from Io. *T. S. Huang and G. L. Siscoe*. **319**, 1003, 106-A1 (1987)
- HUBBARD, E. N. The Velocity Distribution of Quasar/AGN Broad Emission Line Clouds. *R. C. Puetter and E. N. Hubbard*. **320**, 85, 109-A6 (1987)
- HUBBARD, WILLIAM B. Evolution and Infrared Spectra of Brown Dwarfs: Erratum. *Jonathan I. Lunine, William B. Hubbard, and Mark S. Marley*. **316**, 473, 55-B13 (1987) (Orig. paper in **310**, 238, 134-F2)
- HUBER, M. C. E. Absolute Oscillator Strengths for 108 Lines of Si I between 163 and 410 Nanometers. *Peter L. Smith, M. C. E. Huber, G. P. Tozzi, H. E. Griesinger, B. L. Cardon, and G. G. Lombardi*. **322**, 573, 144-B12 (1987)
- HUCHRA, J. P. A Study of a Flux-limited Sample of IRAS Galaxies. *Beverly J. Smith, S. G. Kleinmann, J. P. Huchra, and F. J. Low*. **318**, 161, 80-F5 (1987)
- HUEBNER, W. F. Polyoxymethylene in Comet Halley. *W. F. Huebner, D. C. Boice, and C. M. Sharp*. **320**, L149, 121-F7 (1987)
- HUENEMOERDER, DAVID P. CCD Echelle Observations of the Active RS CVn System II Pegasi. *David P. Huemmoerder and Lawrence W. Ramsey*. **319**, 392, 97-D5 (1987)
- A Flare Event on the Long-Period RS Canum Venaticorum System IM Pegasi. *Derek L. Buzasi, Lawrence W. Ramsey, and David P. Huemmoerder*. **322**, 353, 141-F8 (1987)
- HUGGINS, P. J. CO in the Circumstellar Envelope of Alpha Orionis. *P. J. Huggins*. **313**, 400, 19-D5 (1987)
- The Ultraviolet Spectra of Intermediate-Redshift Quasars. II. *A. L. Kinney, P. J. Huggins, A. E. Glassgold, and J. N. Bregman*. **314**, 145, 29-E7 (1987)
- HUGHES, JOHN P. X-Ray Studies of the Supernova Remnant N132D. I. Morphology. *John P. Hughes*. **314**, 103, 29-B6 (1987)
- HUGHES, P. A. Dynamical Heating of Stars as a Fueling Mechanism for Active Galactic Nuclei. *A. J. Allen and P. A. Hughes*. **313**, 152, 16-F2 (1987)
- HUGHES, V. A. Radio Emission from FK Comae. *V. A. Hughes and B. J. McLean*. **313**, 263, 17-G5 (1987)
- HUMPHREYS, ROBERTA M. The Use of the Brightest Blue Supergiants as Distance Indicators—Further Complications; OR The Brightest “Stars” Are Not Always Stars. *Roberta M. Humphreys and Marc Aaronson*. **318**, L69, 92-C14 (1987)
- HUNTER, C. Nonuniqueness of Self-consistent Equilibrium Solutions for the Perfect Elliptic Disk. *P. T. de Zeeuw, C. Hunter, and M. Schwarzschild*. **317**, 607, 72-F11 (1987)
- HUNTER, DEIDRE A. Star Formation in the Magellanic Irregular Galaxy NGC 4449. *Harley A. Thronson, Jr., Deidre A. Hunter, C. M. Telesco, D. A. Harper, and R. Decher*. **317**, 180, 66-A3 (1987)
- HURFORD, G. J. Multifrequency Observations of a Solar Active Region during a Partial Eclipse. *Dale E. Gary and G. J. Hurford*. **317**, 522, 69-E12 (1987)
- HURLEY, K. Gamma-Ray Burster Counterparts: Infrared. *Bradley E. Schaefer, T. L. Cline, U. Desai, B. J. Teegarden, J.-L. Atteia, C. Barat, K. Hurley, M. Niel, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, I. V. Estulin, and A. V. Kuznetsov*. **313**, 226, 17-D9 (1987)
- Short Solar Events with Evidence of Repetitive Structures. *Upendra D. Desai, Chryssa Koweliotou, C. Barat, K. Hurley, M. Niel, R. Talon, G. Vedrenne, I. V. Estulin, and V. Ch. Dolidze*. **319**, 567, 99-E1 (1987)
- Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. *J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Koweliotou, T. Cline, B. Dennis, U. Desai, and L. Orwig*. **320**, L105, 121-C7 (1987)
- A New Type of Repetitive Behavior in a High-Energy Transient. *J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Koweliotou, T. L. Cline, B. R. Dennis, U. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. **320**, L111, 121-C13 (1987)
- SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806 – 20. *C. Koweliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. **322**, L21, 145-B8 (1987)
- HUTCHINGS, J. B. Imaging Spectroscopy of Five QSOs. *Paul Hickson and J. B. Hutchings*. **312**, 518, 8-E6 (1987)
- What Is the Difference between Radio Galaxies and Radio Quasar Galaxies? *J. B. Hutchings*. **320**, 122, 109-D1 (1987)
- Kinematics and Age of the Low-Mass X-Ray Binaries. *A. P. Cowley, J. B. Hutchings, David Crampton, and F. D. A. Hartwick*. **320**, 296, 111-C11 (1987)
- CAL 83: A Puzzling X-Ray Source in the Large Magellanic Cloud. *David Crampton, A. P. Cowley, J. B. Hutchings, Paul C. Schmidtke, I. B. Thompson, and James Liebert*. **321**, 745, 132-F3 (1987)
- Are There Stellar Winds in the Hot Stars of M31? *J. B. Hutchings, Philip Massey, and L. Bianchi*. **322**, L79, 152-B13 (1987)
- HUTCHINGS, JOHN B. PG 1411 + 442: The Nearest Broad Absorption Line Quasar. *Matthew A. Malkan, Richard F. Green, and John B. Hutchings*. **322**, 729, 147-G6 (1987)
- HUTERS, A. F. A New Constraint on the Galactic Plane ^{26}Al Distribution. *C. J. MacCullum, A. F. Hutters, P. D. Stang, and M. Leventhal*. **317**, 877, 75-F1 (1987)
- HYLAND, A. R. An Active Star Formation Site in RCW 108. *Steven Straw, A. R. Hyland, Terry J. Jones, Paul M. Harvey, Bruce A. Wilking, and Marshall Joy*. **314**, 283, 31-B12 (1987)
- A Near-Infrared Study of the NGC 6334-IV Region. *P. M. Harvey, A. R. Hyland, and S. M. Straw*. **317**, 173, 65-G8 (1987)
- IBEN, ICKO, JR. Evolutionary Scenarios for Intermediate-Mass Stars in Close Binaries. *Icko Iben, Jr. and Alexander V. Tutukov*. **313**, 727, 24-F8 (1987)
- Thermal Evolution of Accreting Neutron Stars. II. Long X-Ray Bursts as a Probe Into the Interior. *Masayuki Y. Fujimoto, Tomoyuki Hanawa, Icko Iben, Jr., and Martin B. Richardson*. **315**, 198, 42-B9 (1987)
- On Interacting Helium Star–White Dwarf Pairs as Supernova Precursors. *Icko Iben, Jr., Ken'ichi Nomoto, Amedeo Tornambè, and Alexander V. Tutukov*. **317**, 717, 73-G11 (1987)
- Degenerate Dwarf Binaries as Promising, Detectable Sources of Gravitational Radiation. *Charles R. Evans, Icko Iben, Jr., and Larry Smarr*. **323**, 129, 154-E1 (1987)
- IGLESIAS, C. A. Reexamination of the Metal Contribution to Astrophysical Opacity. *C. A. Iglesias, F. J. Rogers, and B. G. Wilson*. **322**, L45, 145-D2 (1987)
- IKEUCHI, SATORU. The Formation and Evolution of Dwarf Galaxies and Lyman-Alpha Clouds: Two-Component Dark Matter. *Satoru Ikeuchi and Colin A. Norman*. **312**, 485, 8-C1 (1987)
- Formation of Stellar Shells and X-Ray Coronae around Elliptical Galaxies. *Masayuki Umemura and Satoru Ikeuchi*. **319**, 601, 101-E5 (1987)
- On the Origin of Possible Deviation from the Blackbody Spectrum of the Cosmic Microwave Background Radiation: Inverse Compton Hypothesis Based upon the Explosion Scenario. *Satoshi Yoshioka and Satoru Ikeuchi*. **323**, L7, 158-A10 (1987)
- IMAMURA, J. N. X-Ray and Ultraviolet Radiation from Accreting White Dwarfs. IV. Two-Temperature Treatment with Electron Thermal Conduction. *J. N. Imamura, R. H. Durisen, D. Q. Lamb, and G. J. West*. **313**, 298, 18-B14 (1987)
- IMAMURA, JAMES N. The X-Ray Emission from Gamma-Ray Burst Sources: Constraints on Theoretical Models. *James N. Imamura and Richard I. Epstein*. **313**, 711, 24-E6 (1987)
- A Possible 1.13 Millisecond Periodicity in GX 339 – 4. *James N. Imamura, Thomas Y. Steiman-Cameron, and John Middleditch*. **314**, L11, 33-B13 (1987)
- Rapid Optical Flaring in MXB 1735 – 444 and an Optical Burst from GX 17 + 2. *James N. Imamura, Thomas Y. Steiman-Cameron, and John Middleditch*. **320**, L41, 114-D3 (1987)
- IMHOFF, C. L. X-Ray Sources in Regions of Star Formation. II. The Pre-Main-Sequence G Star HDE 283572. *F. M. Walter, A. Brown, J. L. Linsky, A. E. Rydgren, F. Vrba, M. Roth, L. Carrasco, P. F. Chugainov, N. I. Shakouskaya, and C. L. Imhoff*. **314**, 297, 31-D2 (1987)
- INOUE, H. see MAKINO, F., et al.
- INOUE, H. X-Ray Irradiated Accretion Disks and Bimodal States. *H. Inoue and R. Hoshi*. **322**, 320, 141-C11 (1987)

- INOUE, M. *see* MAKINO, F., *et al.*
- IPSER, JAMES R. On the Maximum Mass of a Uniformly Rotating Neutron Star. *John L. Friedman and James R. Ipser*. **314**, 594, 36-A13 (1987)
- IRWIN, JUDITH A. Evidence for Ram Pressure Stripping of NGC 3073 by Outflowing Gas from NGC 3079. *Judith A. Irwin, E. R. Seaquist, A. R. Taylor, and N. Duric*. **313**, L91, 27-E3 (1987)
- ISHIGURO, M. High-Resolution Observations of CO from the Bipolar Nebula CRL 2688. *R. Kawabe, M. Ishiguro, T. Kasuga, K.-I. Morita, N. Ukita, H. Kobayashi, S. Okumura, E. Fomalont, and N. Kaifu*. **314**, 322, 31-F1 (1987)
- ISHIKAWA, SHIN-ICHI. Detection of Intense Unidentified Lines in TMC-1. *Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito*. **317**, L111, 78-E14 (1987)
- ISHIKAWA, SHIN-ICHI. Laboratory and Astronomical Detection of the Cyclic H_2 Radical. *Satoshi Yamamoto, Shuji Saito, Masatoshi Ohishi, Hiroko Suzuki, Shin-ichi Ishikawa, Norio Kaifu, and Akinori Murakami*. **322**, L55, 145-D12 (1987)
- ISOBE, TAKASHI. Evidence of an Infrared Luminosity Indicator for Galaxies. *Eric D. Feigelson, Takashi Isobe, and Daniel W. Weedman*. **319**, L51, 107-C4 (1987)
- ITOH, NAOKI. Neutrino-Pair Bremsstrahlung in Dense Stars. V. Partially Degenerate Electrons. *Hiroharu Munakata, Yasuhiro Kohyama, and Naoki Itoh*. **316**, 708, 59-G3 (1987)
- Viscosity of Dense Matter. *Naoki Itoh, Yasuhiro Kohyama, and Hideo Tekeuchi*. **317**, 733, 74-A13 (1987)
- Axion Bremsstrahlung in Dense Stars. *Masayuki Nakagawa, Yasuhiro Kohyama, and Naoki Itoh*. **322**, 291, 141-A9 (1987)
- Neutrino-Pair Bremsstrahlung in Dense Stars. IV. Phonon Contributions in the Crystalline Lattice Phase: Erratum. *Naoki Itoh, Yasuhiro Kohyama, Noriyoshi Matsumoto, and Midori Seki*. **322**, 584, 144-C9 (1987) (Orig. paper in **285**, 304, 113-C2)
- Relativistic Free-free Gaunt Factor of the Dense High-Temperature Stellar Plasma. *Masayuki Nakagawa, Yasuhiro Kohyama, and Naoki Itoh*. **63**, 661, 10-E14 (1987) (Abstr. in **313**, 930, 26-G13)
- IZUMIURA, H. Water Maser Emission toward V788 Cygni, A Carbon Star. *Y. Nakada, H. Izumiura, T. Onaka, O. Hashimoto, N. Ukita, S. Deguchi, and T. Tanabé*. **323**, L77, 158-F6 (1987)
- IZUMIURA, HIDEYUKI. Detection of H^{13} CN Maser Emission from the Ground State toward Y Canum Venaticorum. *Hideyuki Izumiura, Nobuharu Ukita, Ryohei Kawabe, Norio Kaifu, Takashi Tsuji, Wasaburo Unno, and Kouichi Koyama*. **323**, L81, 158-F10 (1987)
- JABLONSKI, F. On the Stability of the 13.2 Minute Oscillation of V1223 Sagittarii. *F. Jablonski and J. E. Steiner*. **323**, 672, 162-B2 (1987)
- JABLONSKI, F. J. NSV 12615: An Eclipsing Cataclysmic Variable with Ultrashort Period. *F. J. Jablonski and J. E. Steiner*. **313**, 376, 19-A13 (1987)
- JACKSON, P. D. Microwave Observations of Flare Stars UV Ceti, AT Microscopii, and AU Microscopii. *M. R. Kundu, P. D. Jackson, S. M. White, and M. Melozzi*. **312**, 822, 12-A1 (1987)
- JACKSON, PETER D. Dynamic Spectrum of a Radio Flare on UV Ceti. *Peter D. Jackson, Mukul R. Kundu, and Stephen M. White*. **316**, L85, 62-C14 (1987)
- JACOBSON, A. S. Gamma-Ray Burst Localization by HEAO 3. *R. A. Schwartz, J. C. Ling, W. A. Mahoney, and A. S. Jacobson*. **317**, 846, 75-C7 (1987)
- Long-Term Gamma-Ray Spectral Variability of Cygnus X-1. *J. C. Ling, W. A. Mahoney, Wm. A. Wheaton, and A. S. Jacobson*. **321**, L117, 137-B8 (1987)
- JACOBY, GEORGE H. The Spatial Distribution and Population of Novae in M31. *Robin Ciardullo, Holland C. Ford, James D. Neill, George H. Jacoby, and Allen W. Shafter*. **318**, 520, 86-E6 (1987)
- Multiple-Shell Planetary Nebulae. I. Morphologies and Frequency of Occurrence. *You-Hua Chu, George H. Jacoby, and Richard Arendt*. **64**, 529, 24-C1 (1987) (Abstr. in **317**, 1002, 77-B5)
- JAFFE, D. T. Warm Dense Gas in Luminous Protostellar Regions: A Submillimeter and Far-Infrared CO Line Study. *D. T. Jaffe, A. I. Harris, and R. Genzel*. **316**, 231, 52-E1 (1987)
- Aperture Synthesis Observations of the Circumnuclear Ring in the Galactic Center. *R. Güsten, R. Genzel, M. C. H. Wright, D. T. Jaffe, J. Stutzki, and A. I. Harris*. **318**, 124, 80-C8 (1987)
- Submillimeter and Far-Infrared Spectroscopy of M17 and S106: UV-Heated, Quiescent Molecular Gas? *A. I. Harris, J. Stutzki, R. Genzel, J. B. Lugten, G. J. Stacey, and D. T. Jaffe*. **322**, L49, 145-D6 (1987)
- JAKOBSEN, PETER. $z_{\text{abs}} \sim z_{\text{em}}$ Absorption Systems in Quasar Spectra: A Correlation with Radio and Optical Luminosity? *Palle Møller and Peter Jakobsen*. **320**, L75, 121-A9 (1987)
- JANSEN, F. Correlation between Spectral State and Quasi-periodic Oscillation Parameters in GX 5-1. *M. van der Klis, F. Jansen, J. van Paradijs, W. H. G. Lewin, M. Sztajno, and J. Trümper*. **313**, L19, 21-B7 (1987)
- Intensity and Source State Dependence of the Quasi-periodic Oscillations in Scorpius X-1. *M. van der Klis, L. Stella, N. White, F. Jansen, and A. N. Parmar*. **316**, 411, 54-F3 (1987)
- JEDRZEJEWSKI, ROBERT. The Structure and Evolution of Hoag's Object. *François Schweizer, W. Kent Ford, Jr., Robert Jędrzejewski, and Riccardo Giovanelli*. **320**, 454, 114-D3 (1987)
- JENNINGS, DONALD E. On the Apparent Velocity of Intergrated Sunlight. I. 1983-1985. *Drake Deming, Fred Espenak, Donald E. Jennings, James W. Brault, and Jeremy Wagner*. **316**, 771, 60-E4 (1987)
- JEWELL, P. R. High-Excitation SiO Masers in Evolved Stars. *P. R. Jewell, Dale F. Dickinson, L. E. Snyder, and D. P. Clemens*. **323**, 749, 163-A1 (1987)
- Maps of Dust Clouds at 1.3 Millimeters Associated with Bright H II Regions. *M. A. Gordon and P. R. Jewell*. **323**, 766, 163-B5 (1987)
- JEWITT, D. C. Surface Brightness Profiles of 10 Comets. *D. C. Jewitt and Karen J. Meech*. **317**, 992, 77-A7 (1987)
- JIN, LIPING. Nucleosynthesis inside Thick Accretion Disks around a Black Hole. I. Thermodynamic Conditions and Preliminary Analysis. *Sandip K. Chakrabarti, Liping Jin, and W. David Arnett*. **313**, 674, 24-B10 (1987)
- JOHANSSON, S. Ultraviolet Doubly Excited Fe II Lines in the Laboratory and in the A-Type Star 21 Pegasi. *J. Adam, B. Baschek, S. Johansson, A. E. Nilsson, and T. Brage*. **312**, 337, 4-E6 (1987)
- JOHNSON, DAVID G. A 1% Measurement of the Temperature of the Cosmic Microwave Radiation at $\lambda = 1.2$ Centimeters. *David G. Johnson and David T. Wilkinson*. **313**, L1, 21-A4 (1987)
- JOHNSON, H. M. Optical Survey of IRAS Fields in the Draco Cloud Region (Abstract of Paper in 1987 March Suppl.). *H. M. Johnson and A. R. Klemola*. **313**, 931, 26-G14 (1987)
- Optical Survey of IRAS Fields in the Draco Cloud Region. *H. M. Johnson and A. R. Klemola*. **63**, 701, 11-C8 (1987) (Abstr. in **313**, 931, 26-G14)
- JOHNSON, HOLLIS R. Ultraviolet Spectra and Chromospheres of Cool Carbon Stars. *Hollis R. Johnson and Donald G. Luttermoser*. **314**, 329, 31-F9 (1987)
- JOHNSON, HUGH M. Low-Energy X-Ray Observations of the Wolf 630 System. *Hugh M. Johnson*. **316**, 458, 55-A12 (1987)
- JOHNSON, SCOTT B. The "Alternative X" Question: What Causes the Strong Molecular Bands and Damping Lines in the Very Strong Lined (Super-Metal-rich) Stars? *Benjamin J. Taylor and Scott B. Johnson*. **322**, 930, 150-B2 (1987)
- DDO, Cousins R - I, and Photomultiplier Scanner Data for an Analysis of Very Strong Lined K Giants. *Scott B. Johnson, Michael D. Jøner, and Benjamin J. Taylor*. **63**, 983, 16-B1 (1987) (Abstr. in **314**, 833, 38-F9)
- JOHNSTON, K. J. Evidence for Refractive Scintillation of Two Extragalactic Sources Seen through the Galactic Disk. *Brian Dennison, R. Fiedler, K. J. Johnston, J. H. Spencer, E. B. Waltman, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. **313**, 141, 16-E5 (1987)
- 1928 + 738: A Superluminous Source with Large-Scale Structure. *K. J. Johnston, R. S. Simon, A. Eckart, P. Biermann, C. Schalinski, A. Witzel, and R. G. Strom*. **313**, L85, 27-D11 (1987)
- H₂O Masers in Circumstellar Envelopes. *Adair P. Lane, K. J. Johnston, P. F. Bowers, J. H. Spencer, and P. J. Diamond*. **323**, 756, 163-A8 (1987)
- Daily Observations of Compact Extragalactic Radio Sources at 2695 and 8085 MHz, 1979-1985. *R. L. Fiedler, E. B. Waltman, J. H. Spencer, K. J. Johnston, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. **65**, 319, 33-A5 (1987) (Abstr. in **321**, 1050, 136-A1)
- JOKIPII, J. R. Ultra-High Energy Cosmic Rays in a Galactic Wind and Its Termination Shock. *J. R. Jokipii and G. Morfill*. **312**, 170, 2-G5 (1987)
- Rate of Energy Gain and Maximum Energy in Diffusive Shock Acceleration. *J. R. Jokipii*. **313**, 842, 26-A2 (1987)
- JØNER, MICHAEL D. DDO, Cousins R - I, and Photomultiplier Scanner Data for an Analysis of Very Strong Lined K Giants. *Scott B. Johnson, Michael D. Jøner, and Benjamin J. Taylor*. **63**, 983, 16-B1 (1987) (Abstr. in **314**, 833, 38-F9)
- JONES, B. F. Observations of Jets from Low-Luminosity Stars. II. SVS 12, HH 30, Near HL Tauri, and HH 34. *Martin Cohen and B. F. Jones*. **321**, 846, 133-F13 (1987)
- Optical Spectroscopy of IRAS Sources with Infrared Emission Bands: IRAS 21282 + 5050 and the Diffuse Interstellar Bands. *Martin Cohen and B. F. Jones*. **321**, L151, 137-E1 (1987)
- JONES, BARBARA. Star Formation in Seyfert Galaxies. *J. M. Rodriguez*

- Espinosa, Richard J. Rudy, and Barbara Jones. **312**, 555, 9-A1 (1987)
- JONES, RODNEY V. The Baade-Wesselink Method and the Distances to RR Lyrae Stars. II. The Field Star X Arietis. Rodney V. Jones, Bruce W. Carney, David W. Latham, and Robert L. Kurucz. **312**, 254, 3-F5 (1987)
- The Baade-Wesselink Method and the Distances to RR Lyrae Stars. III. The Field Star SW Draconis. Rodney V. Jones, Bruce W. Carney, David W. Latham, and Robert L. Kurucz. **314**, 605, 36-B10 (1987)
- JONES, T. W. see SVOBODA, R. et al.
- JONES, T. W. A Nonthermal Model for the XUV, Soft X-Ray Emission of AGN and QSOs. T. W. Jones and W. A. Stein. **320**, L1, 114-A4 (1987)
- JONES, TERRY J. An Active Star Formation Site in RCW 108. Steven Straw, A. R. Hyland, Terry J. Jones, Paul M. Harvey, Bruce A. Wilking, and Marshall Joy. **314**, 283, 31-B12 (1987)
- JOSAFATSSON, KARL. CCD Observations of Diffuse Interstellar Bands in Reflection Nebulae. Karl Josefsson and Theodore P. Snow. **319**, 436, 98-A1 (1987)
- JOSEPH, CHARLES L. High-Resolution Ultraviolet Observations of Interstellar Lines toward ζ Persei Observed with the Balloon-borne Ultraviolet Spectrometer. Theodore P. Snow, H. J. G. L. M. Lamers, and Charles L. Joseph. **321**, 952, 135-A2 (1987)
- JOSS, P. C. The Core Mass-Radius Relation for Giants: A New Test of Stellar Evolution Theory. P. C. Joss, S. Rappaport, and W. Lewis. **319**, 180, 95-A5 (1987)
- The Evolutionary Status of 4U 1820 - 30. S. Rappaport, L. A. Nelson, C. P. Ma, and P. C. Joss. **322**, 842, 149-A12 (1987)
- JOSS, PAUL C. Quasi-static Winds from Neutron Stars. Paul C. Joss and Fulvio Melia. **312**, 700, 10-E7 (1987)
- JOSTIES, F. J. Evidence for Refractive Scintillation of Two Extragalactic Sources Seen through the Galactic Disk. Brian Dennison, R. Fiedler, K. J. Johnston, J. H. Spencer, E. B. Waltman, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis. **313**, 141, 16-E5 (1987)
- Daily Observations of Compact Extragalactic Radio Sources at 2695 and 8085 MHz, 1979-1985. R. L. Fiedler, E. B. Waltman, J. H. Spencer, K. J. Johnston, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis. **65**, 319, 33-A5 (1987) (Abstr. in **321**, 1050, 136-A1)
- JOY, M. Far-Infrared Continuum Emission from the Nucleus, Starburst, and Extended Spiral Arms of NGC 1068. D. F. Lester, M. Joy, P. M. Harvey, H. B. Ellis, Jr., and P. S. Parmar. **321**, 755, 132-G1 (1987)
- JOY, MARSHALL. An Active Star Formation Site in RCW 108. Steven Straw, A. R. Hyland, Terry J. Jones, Paul M. Harvey, Bruce A. Wilking, and Marshall Joy. **314**, 283, 31-B12 (1987)
- A Near-Infrared Study of the Luminous Merging Galaxies NGC 2623 and Arp 148. Marshall Joy and Paul M. Harvey. **315**, 480, 46-A4 (1987)
- Far-Infrared Detection of a Circumstellar Dust Torus around Sharpless 106. Paul M. Harvey, Daniel F. Lester, and Marshall Joy. **316**, L75, 62-C5 (1987)
- Infrared Emission from Young Stars in the Nucleus of M82. Marshall Joy, Daniel F. Lester, and Paul M. Harvey. **319**, 314, 96-D5 (1987)
- JOYCE, R. R. A Flux-limited Sample of Galactic Carbon Stars. M. J. Claussen, S. G. Kleinmann, R. R. Joyce, and M. Jura. **65**, 385, 33-F1 (1987) (Abstr. in **321**, 1050, 136-A1)
- JOYCE, RICHARD R. The Dust Shells of NML Cygnus and IRC 10420: Inner Radius, Temperature, and Optical Thickness: Erratum. Stephen T. Ridgway, Richard R. Joyce, Dennis Connors, Judith L. Pipher, and Christopher Dainty. **312**, 963, 13-E1 (1987) (Orig. paper in **302**, 662, 37-G8)
- JUDGE, D. L. Pioneer 10 Observations of the Beta Cephei Stars Gamma Pegasi and Delta Ceti. Geraldine J. Peters, H. S. Ogawa, K. S. Judge, and D. L. Judge. **314**, 261, 31-A3 (1987)
- JUDGE, K. S. Pioneer 10 Observations of the Beta Cephei Stars Gamma Pegasi and Delta Ceti. Geraldine J. Peters, H. S. Ogawa, K. S. Judge, and D. L. Judge. **314**, 261, 31-A3 (1987)
- JUGAKU, JUN. The Abundance of Gallium in B-Type Chemically Peculiar Stars: Addendum. Masahide Takada-Hidai, Kozo Sadakane, and Jun Jugaku. **320**, 437, 112-G4 (1987) (Orig. paper in **304**, 425, 58-D14)
- JUNKKARINEN, VESA T. Spectrophotometry of Six Broad Absorption Line QSOs. Vesa T. Junkkarinen, E. Margaret Burbidge, and Harding E. Smith. **317**, 460, 69-A7 (1987)
- The Nature of the BL Lacertae Object AO 0235 + 164. Ross D. Cohen, Harding E. Smith, Vesa T. Junkkarinen, and E. Margaret Burbidge. **318**, 577, 87-C1 (1987)
- JURA, M. Interstellar Dust in Shapley-Ames Elliptical Galaxies. M. Jura, D. W. Kim, G. R. Knapp, and P. Guhathakurta. **312**, L11, 7-A13 (1987)
- Mass-losing Red Giants in Open Clusters. M. Jura. **313**, 743, 25-A1 (1987)
- A Flux-limited Sample of Galactic Carbon Stars. M. J. Claussen, S. G. Kleinmann, R. R. Joyce, and M. Jura. **65**, 385, 33-F1 (1987) (Abstr. in **321**, 1050, 136-A1)
- JURA, MICHAEL. The $^{12}\text{C}/^{13}\text{C}$ Isotope Ratio of the Interstellar Medium in the Neighborhood of the Sun. Isabel Hawkins and Michael Jura. **317**, 926, 76-C5 (1987)
- JUSZKIEWICZ, ROMAN. Hot Spots in the Microwave Sky. Nicola Vittorio and Roman Juskiewicz. **314**, L29, 39-A9 (1987)
- Double Inflation: A Possible Resolution of the Large-Scale Structure Problem. Michael S. Turner, Jens V. Villumsen, Nicola Vittorio, Joseph Silk, and Roman Juskiewicz. **323**, 423, 159-C1 (1987)
- Minimal Cosmic Background Fluctuations Implied by Streaming Motions. Roman Juskiewicz, Krzysztof Górski, and Joseph Silk. **323**, L1, 158-A4 (1987)
- KAFATOS, M. The Large-Scale Radio Structure of R Aquarii. J. M. Hollis, M. Kafatos, A. G. Michalitsianos, R. J. Oliveren, and F. Yusef-Zadeh. **321**, L55, 129-F6 (1987)
- KAFATOS, MINAS. Supershells and Propagating Star Formation. Richard McCray and Minas Kafatos. **317**, 190, 66-B1 (1987)
- KAFTANDJIAN, V. P. Partial Redistribution in High-Density, Highly Ionized Plasmas. B. Talin, R. Stamm, V. P. Kaftandjian, and Lewis Klein. **322**, 804, 148-E12 (1987)
- KAHANA, S. Collapse of 9 M_{\odot} Stars. E. Baron, J. Cooperstein, and S. Kahana. **320**, 300, 111-D1 (1987)
- Collapsing White Dwarfs. E. Baron, J. Cooperstein, S. Kahana, and K. Nomoto. **320**, 304, 111-D5 (1987)
- KAHN, S. M. Determination of Photospheric Helium Abundances for the Hot White Dwarfs LB 1663 and CD - 38°10980 from EXOSAT Soft X-Ray Photometry. F. B. S. Paerels, J. Heise, S. M. Kahn, and R. D. Rogers. **322**, 315, 141-C6 (1987)
- KAIFU, N. High-Resolution Observations of CO from the Bipolar Nebula CRL 2688. R. Kawabe, M. Ishiguro, T. Kasuga, K.-I. Morita, N. Ukita, H. Kobayashi, S. Okumura, E. Fomalont, and N. Kaifu. **314**, 322, 31-F1 (1987)
- KAIFU, NORIO. Detection of Intense Unidentified Lines in TMC-1. Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito. **317**, L111, 78-E14 (1987)
- Laboratory Detection and Astronomical Identification of a New Free Radical, $\text{CCS}^+(^2\Sigma^-)$. Shuji Saito, Kentarou Kawaguchi, Satoshi Yamamoto, Masatoshi Ohishi, Hiroko Suzuki, and Norio Kaifu. **317**, L115, 78-F3 (1987)
- Laboratory Detection of a New Carbon-Chain Molecule C_3S and Its Astronomical Identification. Satoshi Yamamoto, Shuji Saito, Kentarou Kawaguchi, Norio Kaifu, Hiroko Suzuki, and Masatoshi Ohishi. **317**, L119, 78-F7 (1987)
- Level Population and Para/Ortho Ratio of Fluorescent H_2 in NGC 2023. Tetsuo Hasegawa, Ian Gatley, Ron P. Garden, Peter W. J. L. Brand, Masatoshi Ohishi, Masahiko Hayashi, and Norio Kaifu. **318**, L77, 92-D12 (1987)
- Laboratory and Astronomical Detection of the Cyclic H_3H Radical. Satoshi Yamamoto, Shuji Saito, Masatoshi Ohishi, Hiroko Suzuki, Shin-ichi Ishikawa, Norio Kaifu, and Akinori Murakami. **322**, L55, 145-D12 (1987)
- Detection of H^{13}CN Maser Emission from the Ground State toward Y Canum Venaticorum. Hideyuki Izumiura, Nobuharu Ukita, Ryohei Kawabe, Norio Kaifu, Takashi Tsuji, Wasaburo Unno, and Kouichi Koyama. **323**, L81, 158-F10 (1987)
- KAINER, S. Radiation from Relativistic Beams Interacting with Interstellar Gas. W. K. Rose, J. H. Beall, J. Guillery, and S. Kainer. **314**, 95, 29-A12 (1987)
- KAITCHUCK, RONALD H. Time-resolved Spectrophotometry of the Cataclysmic Variable EX Hydrae. Ronald H. Kaitchuck, Panayiotis A. Hantzios, Panagiotis Kakaletis, R. Kent Honeycutt, and Eric M. Schlegel. **317**, 765, 74-D3 (1987)
- Atlas of Time-resolved Spectrophotometry of Cataclysmic Variables. R. Kent Honeycutt, Ronald H. Kaitchuck, and Eric M. Schlegel. **65**, 451, 34-D4 (1987) (Abstr. in **321**, 1052, 136-A3)
- KAJINO, TOSHITAKA. Radiative Alpha-Capture Rates Leading to $A = 7$ Nuclei: Applications to the Solar Neutrino Problem and Big Bang Nucleosynthesis. Toshitaka Kajino, Hiroshi Toki, and Sam M. Austin. **319**, 531, 99-A12 (1987)
- KAKALETRIS, PANAGIOTIS. Time-resolved Spectrophotometry of the Cataclysmic Variable EX Hydrae. Ronald H. Kaitchuck, Panayiotis A. Hantzios, Panagiotis Kakaletis, R. Kent Honeycutt, and Eric M. Schlegel. **317**, 765, 74-D3 (1987)
- KALLMAN, T. Molecule Formation in Quasar Broad-Line Cloud Gas. T. Kallman, S. Lepp, and P. Giovannoni. **321**, 907, 134-D13 (1987)
- KALLMAN, TIMOTHY R. Rapid Variability of P Cygni Lines in Massive

- X-Ray Binaries. *Timothy R. Kallman, Richard McCray, and G. Mark Voit.* **317**, 746, 74-B12 (1987)
- Fe K Features as Probes of the Nuclear Reflection Region in Seyfert Galaxies. *Julian H. Krolik and Timothy R. Kallman.* **320**, L5, 114-A8 (1987)
- KALLRATH, JOSEF. A New Method to Optimize Parameters in Solutions of Eclipsing Binary Light Curves. *Josef Kallrath and Albert P. Linnell.* **313**, 346, 18-F11 (1987)
- MR Cygni Revisited. *Albert P. Linnell and Josef Kallrath.* **316**, 754, 60-C12 (1987)
- KALUZNY, JANUSZ. The Discovery of Six New Short-Period Variables in the Old Open Cluster NGC 188. *Janusz Kaluzny and Michael M. Shara.* **314**, 585, 36-A2 (1987)
- KANBACH, G. Solar Neutron Emissivity During the Large Flare on 1982 June 3. *E. L. Chupp, H. Debrunner, E. Flückiger, D. J. Forrest, F. Golliez, G. Kanbach, W. T. Vestrand, J. Cooper, and G. Share.* **318**, 913, 91-A1 (1987)
- KANE, S. R. A New Type of Repetitive Behavior in a High-Energy Transient. *J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Koweliotou, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov.* **320**, L111, 121-C13 (1987)
- KANG, HYESUNG. Hydrogen Molecules and the Radiative Cooling of Pregalactic Shocks. *Paul R. Shapiro and Hyesung Kang.* **318**, 32, 79-C8 (1987)
- KAR, K. Late-Time Neutrino Heating and Energetics of Stalled Shocks in Type II Supernovae. *A. Ray and K. Kar.* **319**, 143, 94-E9 (1987)
- KARIMABADI, H. Electron Cyclotron Harmonic Wave Acceleration. *H. Karimabadi, C. R. Menyuk, P. Sprangle, and L. Vlahos.* **316**, 462, 55-B2 (1987)
- KAROVSKA, M. Detection of a Very Bright Source Close to the LMC Supernova SN 1987A. *P. Nissenon, C. Papaliolios, M. Karovska, and R. Noyes.* **320**, L15, 114-B4 (1987)
- KARPEN, J. T. Nonlinear Evolution of Radiation-driven Thermally Unstable Fluids. *R. B. Dahlburg, C. R. DeVore, J. M. Picone, J. T. Mariska, and J. T. Karpen.* **315**, 385, 44-B5 (1987)
- KARPEN, JUDITH T. Nonlocal Thermal Transport in Solar Flares. *Judith T. Karpen and C. Richard DeVore.* **320**, 904, 119-F3 (1987)
- KASHLINSKY, A. Dynamical Friction and Evolution of the Luminosity Function in Clusters of Galaxies. *A. Kashlinsky.* **312**, 497, 8-C13 (1987)
- Gravitational Clustering and the Origin of the Correlation Function of Clusters of Galaxies. *A. Kashlinsky.* **317**, 19, 64-B11 (1987)
- KASUGA, T. High-Resolution Observations of CO from the Bipolar Nebula CRL 2688. *R. Kawabe, M. Ishiguro, T. Kasuga, K.-I. Morita, N. Ukita, H. Kobayashi, S. Okumura, E. Fomalont, and N. Kaifu.* **314**, 322, 31-F1 (1987)
- KASUGA, TAKASHI. Detection of Intense Unidentified Lines in TMC-1. *Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito.* **317**, L111, 78-E14 (1987)
- KATO, T. *see MAKINO, F., et al.*
- KATZ, J. I. An Instability of Radiative Acceleration. *J. I. Katz.* **317**, 264, 66-G3 (1987)
- Positron Annihilation at the Galactic Center. *B. J. Carrigan and J. I. Katz.* **323**, 557, 160-G23 (1987)
- Radiation-Hydrodynamic Calculation of Sub-Eddington Accretion Disks. *G. E. Eggum, F. V. Coroniti, and J. I. Katz.* **323**, 634, 161-F1 (1987)
- KATZ, NEAL. Gravitational Lensing by an Ensemble of Isothermal Galaxies. *Neal Katz and Bohdan Paczynski.* **317**, 11, 64-B3 (1987)
- KAUFMAN, MICHELE. Giant H II Regions in M81. *Michele Kaufman, Frank N. Bash, R. C. Kennicutt, Jr., and P. W. Hodge.* **319**, 61, 93-F7 (1987)
- KAUFMANN, P. Evolution of 3C 273 at 10.7 GHz. *M. H. Cohen, J. A. Zensus, J. A. Biretta, G. Comoretto, P. Kaufmann, and Z. Abraham.* **315**, L89, 49-B11 (1987)
- KAWABE, R. High-Resolution Observations of CO from the Bipolar Nebula CRL 2688. *R. Kawabe, M. Ishiguro, T. Kasuga, K.-I. Morita, N. Ukita, H. Kobayashi, S. Okumura, E. Fomalont, and N. Kaifu.* **314**, 322, 31-F1 (1987)
- KAWABE, RYOHEI. Detection of H¹³CN Maser Emission from the Ground State toward Y Canum Venaticorum. *Hideyuki Izumiura, Nobuharu Ukita, Ryohei Kawabe, Norio Kaifu, Takashi Tsuji, Wasaburo Unno, and Kouichi Koyama.* **323**, L81, 158-F10 (1987)
- KAWAGUCHI, KENTAROU. Laboratory Detection and Astronomical Identification of a New Free Radical, CCS(Σ⁻). *Shuji Saito, Kentarou Kawaguchi, Satoshi Yamamoto, Masatoshi Ohishi, Hiroko Suzuki, and Norio Kaifu.* **317**, L115, 78-F3 (1987)
- Laboratory Detection of a New Carbon-Chain Molecule C₃S and Its Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, Kentarou Kawaguchi, Norio Kaifu, Hiroko Suzuki, and Masatoshi Ohishi.* **317**, L119, 78-F7 (1987)
- KAWAI, YASUSHI. Off-Center Ignition of Nuclear Burning in Merging White Dwarfs. *Yasushi Kawai, Hideyuki Saio, and Ken'ichi Nomoto.* **315**, 229, 42-D12 (1987)
- KAWARA, K. IRAS 18059 - 3211: Optically Known As Gomez's Hamburger: Erratum. *M. T. Ruiz, V. Blanco, J. Maza, S. Heathcote, A. Phillips, K. Kawara, C. Anguita, M. Hamuy, and A. Gomez.* **320**, L157, 121-F14 (1987) (Orig. paper in **316**, L21, 56-B10)
- KAWARA, KIMIAKI. Infrared Photometry and Spectroscopy of Supernova 1986g in NGC 5128-Centaurus A. *Jay A. Frogel, Brooke Gregory, Kimiaki Kawara, Dave Laney, M. M. Phillips, Don Terndrup, Frederick Vrba, and Albert E. Whitford.* **315**, L129, 49-E11 (1987)
- IRAS 1809 - 3211: Optically Known as "Gomez's Hamburger". *Maria Teresa Ruiz, Victor Blanco, José Maza, Steve Heathcote, Andrew Phillips, Kimiaki Kawara, Claudio Anguita, Mario Hamuy, and Arturo Gómez.* **316**, L21, 56-B10 (1987)
- Two Micron Spectroscopy of IRAS Galaxies. *Kimiaki Kawara, Minoru Nishida, and Brooke Gregory.* **321**, L35, 129-D12 (1987)
- KEEL, WILLIAM C. The Host Galaxy of Markarian 231. *Donald Hamilton and William C. Keel.* **321**, 211, 124-E1 (1987)
- KEENAN, F. P. Ne IX Emission-Line Ratios in Solar Active Regions. *F. P. Keenan, D. L. McKenzie, S. M. McCann, and A. E. Kingston.* **318**, 926, 91-B2 (1987)
- KEENE, J. B. CO Emission from Centaurus A. *T. G. Phillips, B. N. Ellison, J. B. Keene, R. B. Leighton, R. J. Howard, C. R. Masson, D. B. Sanders, B. Veidt, and K. Young.* **322**, L73, 152-B8 (1987)
- KEENE, JOCELYN. Comparison of Submillimeter and Ultraviolet Observations of Neutral Carbon toward Zeta Ophiuchi. *Jocelyn Keene, Geoffrey A. Blake, and T. G. Phillips.* **313**, 396, 19-D1 (1987)
- KEMP, J. C. Discovery of Optical Circular Polarization in Lambda Andromedae. *J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook.* **317**, L29, 71-C2 (1987)
- KEMP, JAMES C. Photometry of SS 433 over 7 Years: Study of Two Periodicities. *Tsevi Mazeh, James C. Kemp, Elia M. Leibowitz, Herbert Meninger, and Haim Mendelson.* **317**, 824, 75-A13 (1987)
- KENNAN, F. P. Emission-Line Ratios for O III in Gaseous Nebulae and a Comparison between Theory and Observation. *F. P. Kennan and K. M. Aggarwal.* **319**, 403, 97-E7 (1987)
- KENNICUTT, R. C., JR. Giant H II Regions in M81. *Michele Kaufman, Frank N. Bash, R. C. Kennicutt, Jr., and P. W. Hodge.* **319**, 61, 93-F7 (1987)
- KENYON, S. J. Further Evidence for Disk Accretion in FU Orionis Objects. *L. Hartmann and S. J. Kenyon.* **312**, 243, 3-E8 (1987)
- High Spectral Resolution Infrared Observations of V1057 Cygni. *L. Hartmann and S. J. Kenyon.* **322**, 393, 142-B6 (1987)
- Spectral Energy Distributions of T Tauri Stars: Disk Flaring and Limits on Accretion. *S. J. Kenyon and L. Hartmann.* **323**, 714, 162-E3 (1987)
- KENYON, SCOTT J. Spectroscopic Observations of the Symbiotic Binary RW Hydrae. *Scott J. Kenyon and Telmo Fernandez-Castro.* **316**, 427, 54-F9 (1987)
- The Spectral Evolution of Dwarf Nova Outbursts. *John K. Cannizzo and Scott J. Kenyon.* **320**, 319, 111-E6 (1987)
- KEPLER, S. O. An Independent Method for Determining the Age of the Universe. *D. E. Winget, C. J. Hansen, James Liebert, H. M. Van Horn, G. Fontaine, R. E. Nather, S. O. Kepler, and D. Q. Lamb.* **315**, L77, 49-B1 (1987)
- KERR, F. J. Large-Scale Galactic Dust Morphology and Physical Conditions from IRAS Observations. *T. J. Soderosi, E. Dwek, M. G. Hauser, and F. J. Kerr.* **322**, 101, 139-A10 (1987)
- KERR, FRANK J. Searching at 21 Centimeters for Galaxies behind the Milky Way. *Frank J. Kerr and Patricia A. Henning.* **320**, L99, 121-C2 (1987)
- KETO, ERIC R. Temperature and Density Structure of the Collapsing Core of G10.6 - 0.4. *Eric R. Keto, Paul T. P. Ho, and Aubrey D. Haschick.* **318**, 712, 88-F8 (1987)
- Gravitational Collapse in Molecular Cloud Cores around Ultracompact H II Regions: Two Candidates. *Eric R. Keto, Paul T. P. Ho, and Mark J. Reid.* **323**, L117, 164-C1 (1987)
- KEYES, C. D. A Spectroscopic Survey of 51 Planetary Nebulae. *L. H. Aller and C. D. Keyes.* **65**, 405, 34-A1 (1987) (Abstr. in **321**, 1051, 136-A2)
- KEYES, CHARLES D. Physical Parameters for 12 Planetary Nebulae and Their Central Stars in the Magellanic Clouds. *Lawrence H. Aller, Charles D. Keyes, Stephen P. Maran, Theodore R. Gull, Andrew G. Michalitsianos, and Theodore P. Stecher.* **320**, 159, 109-F12 (1987)
- KIDMAN, RUSSELL B. Pulsations of White Dwarf Stars with Thick Hydrogen or Helium Surface Layers. *Arthur N. Cox, Sumner G. Starrfield, Russell B. Kidman, and W. Dean Pesnell.* **317**, 303, 67-B14 (1987)

- KIELCZEWSKA, D. *see* SVOBODA, R. *et al.*
- KIGUCHI, MASAYOSHI. The Equilibria of Rotating Isothermal Clouds. *Masayoshi Kiguchi, Shinji Narita, Shoken M. Miyama, and Chushiro Hayashi.* **317**, 830, 75-B5 (1987)
- KIKUCHI, S. *see* MAKINO, F., *et al.*
- KILMARTIN, PAMELA M. V677 Centauri: Overcontact and Completely Eclipsing but A-Type or W-Type? *Pamela M. Kilmartin, David H. Bradstreet, and Robert H. Koch.* **319**, 334, 96-E12 (1987)
- KIM, D. W. Interstellar Dust in Shapley-Ames Elliptical Galaxies. *M. Jura, D. W. Kim, G. R. Knapp, and P. Guhathakurta.* **312**, L11, 7-A13 (1987)
- KING, A. R. The Evolution of Magnetic Cataclysmic Variables. *J. M. Hameury, A. R. King, J. P. Lasota, and H. Ritter.* **316**, 275, 53-A9 (1987)
- KING, CHRISTOPHER R. The Age of the Large Magellanic Cloud Cluster NGC 2193. *G. S. Da Costa, Christopher R. King, and J. R. Mould.* **321**, 735, 132-E6 (1987)
- KINGSTON, A. E. Ne IX Emission-Line Ratios in Solar Active Regions. *F. P. Keenan, D. L. McKenzie, S. M. McCann, and A. E. Kingston.* **318**, 926, 91-B2 (1987)
- KINNEY, A. L. The Ultraviolet Spectra of Intermediate-Redshift Quasars. II. *A. L. Kinney, P. J. Huggins, A. E. Glassgold, and J. N. Bregman.* **314**, 145, 29-E7 (1987)
- KINSLow, SCOTT. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. *John D. Anderson, Timothy P. Krisher, Susan E. Borutzki, Michael J. Connolly, Paula M. Eshe, Henry B. Holtz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen.* **323**, L141, 164-E1 (1987)
- KIRK, J. G. On the Acceleration of Charged Particles at Relativistic Shock Fronts. *J. G. Kirk and P. Schneider.* **315**, 425, 45-D1 (1987)
- Particle Acceleration at Shocks: A Monte Carlo Method. *J. G. Kirk and P. Schneider.* **322**, 256, 140-F2 (1987)
- KIRK, JOHN G. Electron Injection by Relativistic Protons in Active Galactic Nuclei. *Marek Sikora, John G. Kirk, Mitchell C. Begelman, and Peter Schneider.* **320**, L81, 121-B1 (1987)
- Fermi Acceleration at Shocks with Arbitrary Velocity Profiles. *Peter Schneider and John G. Kirk.* **323**, L87, 158-G1 (1987)
- KIRK, R. L. Hydromagnetic Constraints on Deep Zonal Flow in the Giant Planets. *R. L. Kirk and D. J. Stevenson.* **316**, 836, 61-C4 (1987)
- KIRSHNER, R. P. The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. *R. P. Kirshner, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Leveault.* **317**, 355, 67-F14 (1987)
- The Interstellar Medium toward Supernova 1987A. *A. K. Dupree, R. P. Kirshner, G. E. Nassiopoulos, J. C. Raymond, and G. Sonneborn.* **320**, 597, 116-B11 (1987)
- KIRSHNER, ROBERT P. A Survey of the Bootes Void. *Robert P. Kirshner, Augustus Oemler, Jr., Paul L. Schechter, and Stephen A. Shectman.* **314**, 493, 35-A2 (1987)
- Emission-Line Galaxies in the Bootes Void. *J. Ward Moody, Robert P. Kirshner, Gordon M. MacAlpine, and Stephen A. Gregory.* **314**, L33, 39-A13 (1987)
- High-Velocity Emission in Young Supernova Remnants: SN 1006 and SN 1572. *Robert P. Kirshner, P. Frank Winkler, and Roger A. Chevalier.* **315**, L135, 49-F3 (1987)
- Ultraviolet Observations of SN 1987A. *Robert P. Kirshner, George Sonneborn, D. Michael Crenshaw, and George E. Nassiopoulos.* **320**, 602, 116-C2 (1987)
- The Progenitor of SN 1987A: Spatially Resolved Ultraviolet Spectroscopy of the Supernova Field. *George Sonneborn, Bruce Altner, and Robert P. Kirshner.* **323**, L35, 158-C7 (1987)
- KLATT, C. Velocity Waves in 21 Centimeter Self-Absorption toward the Taurus Molecular Complex. *W. L. H. Shuter, R. L. Dickman, and C. Klatt.* **322**, L103, 152-D8 (1987)
- KLEBESADEL, R. W. Gamma-Ray Burster Counterparts: Infrared. *Bradley E. Schaefer, T. L. Cline, U. Desai, B. J. Teegarden, J.-L. Atteia, C. Barat, K. Hurley, M. Niel, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J. V. Estulin, and A. V. Kuznetsov.* **313**, 226, 17-D9 (1987)
- Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. *J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Kouveliotou, T. Cline, B. Dennis, U. Desai, and U. Orwig.* **320**, L105, 121-C7 (1987)
- A New Type of Repetitive Behavior in a High-Energy Transient. *J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Kouveliotou, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov.* **320**, L111, 121-C13 (1987)
- SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806 - 20. *C. Kouveliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov.* **322**, L21, 145-B8 (1987)
- KLECKER, B. The Mean Ionic Charge of Silicon in ³He-rich Solar Flares. *A. Luhn, B. Klecker, D. Hovestadt, and E. Möbius.* **317**, 951, 76-E2 (1987)
- A Multispacecraft Study of the Injection and Transport of Solar Energetic Particles. *J. Beeck, G. M. Mason, D. C. Hamilton, G. Wibberenz, H. Kunow, D. Hovestadt, and B. Klecker.* **322**, 1052, 151-D14 (1987)
- KLEIN, LEWIS. Partial Redistribution in High-Density, Highly Ionized Plasmas. *B. Talin, R. Stamm, V. P. Kaftandjian, and Lewis Klein.* **322**, 804, 148-E12 (1987)
- KLEIN, RICHARD I. Radiation Gas Dynamics of Polar Cap Accretion onto Magnetized Neutron Stars: Basic Theory. *Jonathan Arons, Richard I. Klein, and Susan M. Lea.* **312**, 666, 10-C1 (1987)
- Time-dependent Calculations of X-Ray and γ Reprocessing. *Lynn R. Cominsky, Richard A. London, and Richard I. Klein.* **315**, 162, 41-F14 (1987)
- KLEIN, U. A Statistical Analysis of the Einstein Normal Galaxy Sample. III. Radio and X-Ray Properties of Elliptical and S0 Galaxies. *G. Fabbiano, U. Klein, G. Trinchieri, and R. Wiebeinski.* **312**, 111, 2-C1 (1987)
- KLEINER, S. C. Small-Scale Structure of the Taurus Molecular Clouds: Turbulence in Heiles' Cloud 2. *S. C. Kleiner and R. L. Dickman.* **312**, 837, 12-B2 (1987)
- KLEINMANN, S. G. Radial Velocities of Late-Type Stars in the Galactic Center. *K. Sellgren, D. N. B. Hall, S. G. Kleinmann, and N. Z. Scoville.* **317**, 881, 75-F5 (1987)
- A Study of a Flux-limited Sample of IRAS Galaxies. *Beverly J. Smith, S. G. Kleinmann, J. P. Huchra, and F. J. Low.* **318**, 161, 80-F5 (1987)
- A Flux-limited Sample of Galactic Carbon Stars. *M. J. Claussen, S. G. Kleinmann, R. R. Joyce, and M. Jura.* **65**, 385, 33-F1 (1987) (Abstr. in **321**, 1050, 136-A1)
- KLEMOLA, A. R. Optical Survey of IRAS Fields in the Draco Cloud Region (Abstract of Paper in 1987 March Suppl.). *H. M. Johnson and A. R. Klemola.* **313**, 931, 26-G14 (1987)
- Optical Survey of IRAS Fields in the Draco Cloud Region. *H. M. Johnson and A. R. Klemola.* **63**, 701, 11-C8 (1987) (Abstr. in **313**, 931, 26-G14)
- KLEPCZYNSKI, W. J. Evidence for Refractive Scintillation of Two Extragalactic Sources Seen through the Galactic Disk. *Brian Dennison, R. Fiedler, K. J. Johnston, J. H. Spencer, E. B. Waltman, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis.* **313**, 141, 16-E5 (1987)
- Daily Observations of Compact Extragalactic Radio Sources at 2695 and 8085 MHz, 1979-1985. *R. L. Fiedler, E. B. Waltman, J. H. Spencer, K. J. Johnston, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis.* **65**, 319, 33-A5 (1987) (Abstr. in **321**, 1050, 136-A1)
- KLIMCHUK, J. A. The Magnetic and Velocity Structure Adjacent to Solar Active Regions. *R. Grant Athay and J. A. Klimchuk.* **318**, 437, 83-F7 (1987)
- A Numerical Study of the Nonlinear Thermal Stability of Solar Loops. *J. A. Klimchuk, S. K. Antiochos, and J. T. Mariska.* **320**, 409, 112-D13 (1987)
- KLIMCHUK, JAMES A. On the Large-Scale Dynamics and Magnetic Structure of Solar Active Regions. *James A. Klimchuk.* **323**, 368, 157-B1 (1987)
- KLIMIS, GEORGE S. Effects of Electron Scattering on the Oscillations of an X-Ray Source. *Nikolaos D. Kylafis and George S. Klimis.* **323**, 678, 162-B8 (1987)
- KLINGESMITH, D. A. A Palomar Observatory Sky Survey Atlas of Selected Molecular Clouds. *D. A. Klingesmith and J. M. Hollis.* **64**, 127, 18-F5 (1987) (Abstr. in **315**, 731, 48-E12)
- KLINGESMITH, DANIEL A., III. Deep Einstein X-Ray Imagery of the Small Magellanic Cloud. *Frederick C. Bruhweiler, Daniel A. Klingesmith III, Theodore R. Gull, and Sabatino Sofia.* **317**, 152, 65-E11 (1987)
- KNAPP, G. R. Interstellar Dust in Shapley-Ames Elliptical Galaxies. *M. Jura, D. W. Kim, G. R. Knapp, and P. Guhathakurta.* **312**, L11, 7-A13 (1987)
- Detection of H I Emission from the Circumstellar Envelope of Alpha Orionis. *P. F. Bowers and G. R. Knapp.* **315**, 305, 43-C4 (1987)
- Mass Loss from Evolved Stars. VII. OH Maser Shell Radii and

- Mass-Loss Rates for OH/IR Stars. *Nathan Netzer and G. R. Knapp.* **323**, 734, 162-F12 (1987)
- KO, C. M. Cosmic-Ray-modified Stellar Winds. I. Solution Topologies and Singularities. *C. M. Ko and G. M. Webb.* **323**, 657, 162-A1 (1987)
- KOBAYASHI, H. High-Resolution Observations of CO from the Bipolar Nebula CRL 2688. *R. Kawabe, M. Ishiguro, T. Kasuga, K.-I. Morita, N. Ukiita, H. Kobayashi, S. Okumura, E. Fomalont, and N. Kaifu.* **314**, 322, 31-F1 (1987)
- KOCH, CH. Antiproton Production of Propagating Cosmic Rays under Distributed Reacceleration. *Manfred Simon, U. Heinbach, and Ch. Koch.* **320**, 699, 117-D6 (1987)
- KOCH, ROBERT H. V677 Centauri: Overcontact and Completely Eclipsing but A-Type or W-Type? *Pamela M. Kilmartin, David H. Bradstreet, and Robert H. Koch.* **319**, 334, 96-E12 (1987)
- KOCHANÉK, CHRISTOPHER S. How Big Are Supermassive Black Holes Formed from the Collapse of Dense Star Clusters? *Christopher S. Kochanek, Stuart L. Shapiro, and Saul A. Teukolsky.* **320**, 73, 108-G8 (1987)
- Gravitational Imaging by Isolated Elliptical Potential Wells. I. Cross Sections. *Roger D. Blandford and Christopher S. Kochanek.* **321**, 658, 131-F1 (1987)
- Gravitational Imaging by Isolated Elliptical Potential Wells. II. Probability Distributions. *Christopher S. Kochanek and Roger D. Blandford.* **321**, 676, 132-A3 (1987)
- KOENIGSBERGER, G. Atmospheric Eclipses in the SMC Wolf-Rayet Eclipsing Binary HD 5980: The Heavy versus the Light Metal Abundance. *G. Koenigsberger, A. F. J. Moffat, and L. H. Auer.* **322**, L41, 145-C12 (1987)
- KOESTER, D. Gravitational Redshift and Mass-Radius Relation in White Dwarfs. *D. Koester.* **322**, 852, 149-B8 (1987)
- KOGUT, ALAN. Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. *George F. Smoot, Marc Bershadoun, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Witebsky.* **317**, L45, 78-A9 (1987)
- KOHL, JOHN L. Solar Wind Diagnostics from Doppler-enhanced Scattering. *Giancarlo Noci, John L. Kohl, and George L. Withbroe.* **315**, 706, 48-D1 (1987)
- KOYAMA, YASU HARU. Neutrino-Pair Bremsstrahlung in Dense Stars. V. Partially Degenerate Electrons. *Hiroharu Munakata, Yasu haru Koyama, and Naoki Itoh.* **316**, 708, 59-G3 (1987)
- Viscosity of Dense Matter. *Naoki Itoh, Yasu haru Koyama, and Hideo Tekeuchi.* **317**, 733, 74-A13 (1987)
- Axion Bremsstrahlung in Dense Stars. *Masayuki Nakagawa, Yasu haru Koyama, and Naoki Itoh.* **322**, 291, 141-A9 (1987)
- Neutrino-Pair Bremsstrahlung in Dense Stars. IV. Phonon Contributions in the Crystalline Lattice Phase: Erratum. *Naoki Itoh, Yasu haru Koyama, Noriyoshi Matsumoto, and Midori Seki.* **322**, 584, 144-C9 (1987) (Orig. paper in **285**, 304, 113-C2)
- Relativistic Free-free Gaunt Factor of the Dense High-Temperature Stellar Plasma. *Masayuki Nakagawa, Yasu haru Koyama, and Naoki Itoh.* **63**, 661, 10-E14 (1987) (Abstr. in **313**, 930, 26-G13)
- KONDO, Y. see MAKINO, F., et al.
- KÖNIGL, ARIEH. Magnetic Braking in Weakly Ionized Media. *Arieh Königl.* **320**, 726, 117-F6 (1987)
- Pair-Creation Effects in Accretion Shock Models of Active Galactic Nuclei. *John M. Blondin and Arieh Königl.* **323**, 451, 159-E1 (1987)
- KOONIN, S. E. Effect of Ion Correlations on Free-Free Opacities. *N. R. Dagdeviren and S. E. Koonin.* **319**, 192, 95-B3 (1987)
- KORISTA, KIRK T. The Double Broad-Line Emitting Regions in NGC 5548 as Possible Evidence for a Supermassive Binary. *Bradley M. Peterson, Kirk T. Korista, and Stephen A. Cota.* **312**, L1, 7-A4 (1987)
- KOSUGI, T. Current Loop Coalescence Model of Solar Flares. *T. Tajima, J. Sakai, H. Nakajima, T. Kosugi, F. Brunel, and M. R. Kundu.* **321**, 1031, 135-F11 (1987)
- KOUVELIOTOU, C. Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. *J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Kouveliotou, T. Cline, B. Dennis, U. Desai, and L. Orwig.* **320**, L105, 121-C7 (1987)
- A New Type of Repetitive Behavior in a High-Energy Transient. *J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, R. Kane, C. Kouveliotou, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov.* **320**, L111, 121-C13 (1987)
- SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806 - 20. *C. Kouveliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Neil, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov.* **322**, L21, 145-B8 (1987)
- KOUVELIOTOU, CHRYSSA. Short Solar Events with Evidence of Repetitive Structures. *Upendra D. Desai, Chryssa Kouveliotou, C. Barat, K. Hurley, M. Niel, R. Talon, G. Vedrenne, I. V. Estulin, and V. Ch. Dolidze.* **319**, 567, 99-E1 (1987)
- KOVÁCS, G. Application of Time-dependent Fourier Analysis to Nonlinear Pulsational Stellar Models. *G. Kovács, J. R. Buchler, and C. G. Davis.* **319**, 247, 95-F6 (1987)
- KOVÁCS, GÉZA. Modal Selection in Stellar Pulsators. II. Application to RR Lyrae Models. *J. Robert Buchler and Géza Kovács.* **318**, 232, 81-D7 (1987)
- Period Doubling Bifurcations and Chaos in W Virginis Models. *J. Robert Buchler and Géza Kovács.* **320**, L57, 114-E3 (1987)
- KOVETZ, ATTAY. Evolution of a 0.7 M_{\odot} Red Giant. *Amos Harpaz, Attay Kovetz, and Giora Shaviv.* **323**, 154, 154-F13 (1987)
- KOVNER, ISRAEL. The Quadrupole Gravitational Lens. *Israel Kovner.* **312**, 22, 1-B14 (1987)
- The Thick Gravitational Lens: A Lens Composed of Many Elements at Different Distances. *Israel Kovner.* **316**, 52, 50-E10 (1987)
- Extraction of Cosmological Information from Multiimage Gravitational Lenses. *Israel Kovner.* **318**, L1, 85-A4 (1987)
- The Marginal Gravitational Lensing. *Israel Kovner.* **321**, 686, 132-A13 (1987)
- Concerning the Limit on the Mean Mass Distribution of Galaxies from Their Gravitational Lens Effect. *Israel Kovner and Mordehai Milgrom.* **321**, L113, 137-B5 (1987)
- Extraction of Cosmological Information from Multiimage Gravitational Lenses: Erratum. *Israel Kovner.* **323**, L155, 164-E13 (1987) (Orig. paper in **318**, L1, 85-A4)
- KOYAMA, K. see MAKINO, F., et al.
- KOYAMA, K. Spectra and Pulse Period of the Binary X-Ray Pulsar 4U 1538 - 52. *K. Makishima, K. Koyama, S. Hayakawa, and F. Nagase.* **314**, 619, 36-C10 (1987)
- KOYAMA, KOUICHI. Detection of $H^{13}CN$ Maser Emission from the Ground State toward Y Canum Venaticorum. *Hideyuki Izumiura, Nobuharu Ukiita, Ryohei Kawabe, Norio Kaifu, Takashi Tsuji, Wasaburo Unno, and Kouichi Koyama.* **323**, L81, 158-F10 (1987)
- KOZLOVSKY, B. Positrons from Accelerated Particle Interactions. *B. Kozlovsky, R. E. Lingenfelter, and R. Ramaty.* **316**, 801, 60-G6 (1987)
- KRAUS, D. J. Discovery of Optical Circular Polarization in Lambda Andromedae. *J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook.* **317**, L29, 71-C2 (1987)
- KRAUSS, LAWRENCE M. Gravitational Lensing by Isothermal Spheres with Finite Core Radii: Galaxies and Dark Matter. *Gary Hinshaw and Lawrence M. Krauss.* **320**, 468, 114-E7 (1987)
- KRELOWSKI, J. Three Families of Diffuse Interstellar Bands? *J. Krelowski and G. A. H. Walker.* **312**, 860, 12-C11 (1987)
- Interdependence of the 4430 Å Diffuse Interstellar Band, Polarization, and Ultraviolet Extinction. *J. Krelowski, G. A. H. Walker, G. R. Grieve, and G. M. Hill.* **316**, 449, 55-A3 (1987)
- KRISCIUNAS, K. The Broad-Line Region at the Center of the Galaxy. *T. R. Geballe, R. Wade, K. Krisciunas, I. Gatley, and M. C. Bird.* **320**, 562, 115-F12 (1987)
- Ionization State in and Reddening to the Center of the Galaxy. *R. Wade, T. R. Geballe, K. Krisciunas, I. Gatley, and M. C. Bird.* **320**, 570, 115-G7 (1987)
- KRISHER, TIMOTHY P. 4U 1820 - 30 as a Potential Test of the Nonsymmetric Gravitational Theory of Moffat. *Timothy P. Krisher.* **320**, L47, 114-D8 (1987)
- Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. *John D. Anderson, Timothy P. Krisher, Susan E. Borutzki, Michael J. Connally, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen.* **323**, L141, 164-E1 (1987)
- KRISHNA SWAMY, K. S. Statistical Equilibrium in Cometary C_2 . IV. A 10 Level Model Including Singlet-Triplet Transitions. *K. S. Krishna Swamy and C. R. O'Dell.* **317**, 543, 69-G7 (1987)
- KRISTIAN, JEROME H. Maps of 50 Galaxies with Polar Rings. *J. H. van Gorkom, Paul L. Schechter, and Jerome Kristian.* **314**, 457, 34-E3 (1987)
- KROLIK, JULIAN H. Fe K Features as Probes of the Nuclear Reflection Region in Seyfert Galaxies. *Julian H. Krolik and Timothy R. Kallman.* **320**, L5, 114-A8 (1987)
- KROPP, W. R. see SVOBODA, R. et al.
- KROTO, H. W. Long Carbon Chain Molecules in Circumstellar Shells. *H. W. Kroto, J. R. Heath, S. C. O'Brien, R. F. Curl, and R. E. Smalley.* **314**, 352, 32-A9 (1987)
- KRUGLYAK, L. Non-Newtonian Forces and the Invisible Mass Problem.

- J. R. Kuhn and L. Kruglyak. **313**, 1, 15-A7 (1987)
- KUECHLER, G. Radiative Transitions in ^{27}Al and Their Relevance to the $^{26}\text{Al}(p,\gamma)^{27}\text{Si}$ Reaction under Stellar Conditions. C. Rangacharyulu, G. Kuechler, A. Richter, and E. Spamer. **320**, 405, 112-D9 (1987)
- KUHN, J. R. Non-Newtonian Forces and the Invisible Mass Problem. J. R. Kuhn and L. Kruglyak. **313**, 1, 15-A7 (1987)
- Is the Solar Oblateness Variable? Measurements of 1985. R. H. Dicke, J. R. Kuhn, and K. G. Libbrecht. **318**, 451, 83-G9 (1987)
- Observations of a Solar Latitude-dependent Limb Brightness Variation: Erratum. J. R. Kuhn, K. G. Libbrecht, and R. H. Dicke. **319**, 1010, 106-A8 (1987) (Orig. paper in **290**, 758, 32-C8)
- KUIJPERS, J. On the Controversy Concerning Turbulent Bremsstrahlung. D. B. Melrose and J. Kuipers. **323**, 338, 156-F7 (1987)
- KUNDU, M. R. Microwave Observations of Flare Stars UV Ceti, AT Microscopii, and AU Microscopii. M. R. Kundu, P. D. Jackson, S. M. White, and M. Melozzi. **312**, 822, 12-A1 (1987)
- The Plasma and Magnetic Field Properties of Coronal Loops Observed at High Spatial Resolution. D. F. Webb, G. D. Holman, J. M. Davis, M. R. Kundu, and R. K. Shevgaonkar. **315**, 716, 48-D11 (1987)
- Simultaneous VLA Observations of a Flare at 6 and 20 Centimeter Wavelengths. T. Velusamy, M. R. Kundu, E. J. Schmahl, and M. McCabe. **319**, 984, 105-F4 (1987)
- Simultaneous 2 and 6 Centimeter Wavelength Observations of a Solar Flare Using the VLA. M. R. Kundu, T. Velusamy, and S. M. White. **321**, 593, 123-E9 (1987)
- Current Loop Coalescence Model of Solar Flares. T. Tajima, J. Sakai, H. Nakajima, T. Kosugi, F. Brunel, and M. R. Kundu. **321**, 1031, 135-F11 (1987)
- KUNDU, MUKUL R. Dynamic Spectrum of a Radio Flare on UV Ceti. Peter D. Jackson, Mukul R. Kundu, and Stephen M. White. **316**, L85, 62-C14 (1987)
- KUNOW, H. A. Multispacecraft Study of the Injection and Transport of Solar Energetic Particles. J. Beeck, G. M. Mason, D. C. Hamilton, G. Wibberenz, H. Kunow, D. Hovestadt, and B. Klecker. **322**, 1052, 151-D14 (1987)
- KUNTH, DANIEL. High-Resolution Spectra of 24 Low-Redshift QSOs: The Properties of Mg II Absorption Systems. David Tytler, A. Boksenberg, Wallace L. W. Sargent, Peter Young, and Daniel Kunth. **64**, 667, 27-B8 (1987) (Abstr. in **318**, 945, 91-C10)
- KURSINSKI, EMIL R. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. John D. Anderson, Timothy P. Krisher, Susan E. Borutski, Michael J. Connally, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine J. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen. **323**, L141, 164-E1 (1987)
- KURTZ, DONALD W. The Exotic Helium Variable PG 1346 + 082. M. A. Wood, D. E. Winget, R. E. Nather, Frederic V. Hessman, James Liebert, Donald W. Kurtz, F. Wesemael, and G. Wegner. **313**, 757, 25-B1 (1987)
- The Rich p-Mode Spectrum of the Rapidly Oscillating Peculiar A Star HD 60435. Jaymie M. Matthews, Donald W. Kurtz, and William H. Wehlau. **313**, 782, 25-C12 (1987)
- KURUCZ, ROBERT L. The Baade-Wesselink Method and the Distances to RR Lyrae Stars. II. The Field Star X Arietis. Rodney V. Jones, Bruce W. Carney, David W. Latham, and Robert L. Kurucz. **312**, 254, 3-F5 (1987)
- The Baade-Wesselink Method and the Distances to RR Lyrae Stars. III. The Field Star SW Draconis. Rodney V. Jones, Bruce W. Carney, David W. Latham, and Robert L. Kurucz. **314**, 605, 36-B10 (1987)
- OH and CH Continuous Opacity in Solar and Stellar Atmospheres. Robert L. Kurucz, Ewine F. van Dishoeck, and S. P. Tarafdar. **322**, 992, 150-F13 (1987)
- KUSUNOSE, MASAOKI. Relativistic Thermal Plasmas: Time Development of Electron-Positron Pair Concentration. Masaaki Kusunose. **321**, 186, 124-C3 (1987)
- KUTNER, MARC L. Molecular Clouds in the Outer Galaxy. I. Far-Infrared Observations. Kathryn N. Mead, Marc L. Kutner, Neal J. Evans II, Paul M. Harvey, and Bruce A. Wilking. **312**, 321, 4-D4 (1987)
- VLA Observations of H_2CO in Absorption against the Cosmic Background Radiation: Clumps in the S140 Molecular Cloud. Neal J. Evans II, Marc L. Kutner, and Lee G. Mundy. **323**, 145, 154-F3 (1987)
- KUTTER, G. SIEGFRIED. Stellar Accretion of Matter Possessing Angular Momentum. G. Siegfried Kutter and Warren M. Sparks. **321**, 386, 126-D7 (1987)
- Nuclear Runaways in a C/O White Dwarf Accreting H-rich Material Possessing Angular Momentum. Warren M. Sparks and G. Siegfried Kutter. **321**, 394, 126-E1 (1987)
- KUZNETSOV, A. V. Gamma-Ray Burster Counterparts: Infrared. Bradley E. Schaefer, T. L. Cline, U. Desai, B. J. Teegarden, J.-L. Atteia, C. Barat, K. Hurley, M. Niel, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, I. V. Estulin, and A. V. Kuznetsov. **313**, 226, 17-D9 (1987)
- Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Koweliotou, T. Cline, B. Dennis, U. Desai, and L. Orwig. **320**, L105, 121-C7 (1987)
- A New Type of Repetitive Behavior in a High-Energy Transient. J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Koweliotou, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov. **320**, L111, 121-C13 (1987)
- SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806 - 20. C. Koweliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Neil, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov. **322**, L21, 145-B8 (1987)
- KWAN, JOHN. The Spatial and Mass Distributions of Molecular Clouds and Spiral Structures. John Kwan and Francisco Valdes. **315**, 92, 41-A2 (1987)
- KWOK, SUN. Ground-based Observations of IRAS Candidates for Late Asymptotic Giant Branch Stars. Sun Kwok, Bruce J. Hrivnak, and R. T. Boreiko. **312**, 303, 4-B14 (1987)
- On the Contribution of Interstellar Extinction to the 10 Micron Dust Feature in OH/IR Stars. Kevin Volk and Sun Kwok. **315**, 654, 47-G1 (1987)
- CO Observations of IRAS Sources with 11.3 Micron Silicon Carbide Dust Features. D. A. Leahy, Sun Kwok, and R. A. Arquilla. **320**, 825, 118-F13 (1987)
- Ground-based Infrared Observations of Variable IRAS Sources as Candidates for Late Asymptotic Giant Branch Stars. Sun Kwok, Bruce J. Hrivnak, and R. T. Boreiko. **321**, 975, 135-B11 (1987)
- KYLAFIS, NIKOLAOS D. Dust Distribution in Spiral Galaxies. Nikolaos D. Kylafis and John N. Bahcall. **317**, 637, 73-A13 (1987)
- On Pumping the Strong Water Maser Sources. Nikolaos D. Kylafis and Colin Norman. **323**, 346, 156-G1 (1987)
- Effects of Electron Scattering on the Oscillations of an X-Ray Source. Nikolaos D. Kylafis and George S. Klimis. **323**, 678, 162-B8 (1987)
- LABONTE, B. J. Acoustic Absorption by Sunspots. D. C. Braun, T. L. Dwall, Jr., and B. J. LaBonte. **319**, L27, 100-C9 (1987)
- LACEY, C. G. Dark Clusters in Galactic Halos? B. J. Carr and C. G. Lacey. **316**, 23, 50-C6 (1987)
- LACHIEZE-REY, MARC. Void Probabilities in the Galaxy Distribution: Scaling and Luminosity Segregation. Sophie Maurogordato and Marc Lachieze-Rey. **320**, 13, 108-B5 (1987)
- LACY, JOHN. Direct Imaging at 12 Microns of the Star-forming Region W51 IRS 2. John Bally, John F. Arens, Roger Ball, Robert Becker, and John Lacy. **323**, L73, 158-F1 (1987)
- LADA, CHARLES J. Spectral Evolution of Young Stellar Objects. Fred C. Adams, Charles J. Lada, and Frank H. Shu. **312**, 788, 11-E3 (1987)
- LADD, EDWIN F. Simultaneous Measurements of Sunspot Umbra Oscillations in the Photosphere, Chromosphere, and Transition Region. John H. Thomas, Bruce W. Lites, Joseph B. Gurman, and Edwin F. Ladd. **312**, 457, 5-G9 (1987)
- LAIDLER, VICTORIA G. The Composite Image of Sanduleak -69°202, Candidate Precursor to Supernova 1978A in the Large Magellanic Cloud. Nolan R. Walborn, Barry M. Lasker, Victoria G. Laidler, and You-Hua Chu. **321**, L41, 129-E4 (1987)
- LAKE, GEORGE. The H I Distribution and Kinematics in Four Low-Luminosity Elliptical Galaxies. George Lake, R. A. Schommer, and J. H. van Gorkom. **314**, 57, 28-E12 (1987)
- LAKE, KAYLL. Hydrostatic Confinement of Radio Jets. Kayll Lake and Patrick Boucher. **314**, 507, 34-B2 (1987)
- LAMB, D. Q. Synchrotron Emission and Gamma-Ray Bursts. J. J. Brainerd and D. Q. Lamb. **313**, 231, 7-D14 (1987)
- X-Ray and Ultraviolet Radiation from Accreting White Dwarfs. IV. Two-Temperature Treatment with Electron Thermal Conduction. J. N. Imamura, R. H. Durisen, D. Q. Lamb, and G. J. Weast. **313**, 298, 18-B14 (1987)
- An Independent Method for Determining the Age of the Universe. D. E. Winget, C. J. Hansen, James Liebert, H. M. Van Horn, G. Fontaine, R. E. Nather, S. O. Kepler, and D. Q. Lamb. **315**, L77, 49-B1 (1987)
- S-Matrix Calculation of the Triple-Alpha Reaction. Ikko Fushiki and D. Q. Lamb. **317**, 368, 68-A1 (1987)

- Synchronization-induced Period Gaps and Ultra-Short Periods in Magnetic Cataclysmic Binaries. *D. Q. Lamb and Fulvio Melia*. **321**, L133, L137-C11 (1987)
- Dynamical Mass Transfer in Cataclysmic Binaries. *Fulvio Melia and D. Q. Lamb*. **321**, L139, L137-D2 (1987)
- New Insights from a Global View of X-Ray Bursts. *Ikko Fushiki and D. Q. Lamb*. **323**, L55, L58-D10 (1987)
- Discovery of Radio Emission from AE Aquarii. *J. A. Bookbinder and D. Q. Lamb*. **323**, L131, L64-D7 (1987)
- LAMB, F. K. Apsidal Advance in Vela X-1. *J. E. Deeter, P. E. Boynton, F. K. Lamb, and G. Zylstra*. **314**, 634, 36-E1 (1987)
- Effect of an Electron Scattering Cloud on X-Ray Oscillations Produced by Beaming. *J. Brainerd and F. K. Lamb*. **317**, L33, 71-C6 (1987)
- Power Spectra of Quasi-periodic Oscillations in Luminous X-Ray Stars. *N. Shibasaki and F. K. Lamb*. **318**, 767, 89-C11 (1987)
- LAMB, G. M. Structure in the Nucleus of NGC 1068 at 10 Microns. *R. Tresch-Fienberg, G. G. Fazio, D. Y. Gezari, W. F. Hoffmann, G. M. Lamb, P. K. Shu, and C. R. McCreight*. **312**, 542, 8-G2 (1987)
- LAMB, R. C. Reexamination of the SAS 2 Cygnus X-3 Data. *C. E. Fichtel, D. J. Thompson, and R. C. Lamb*. **319**, 362, 97-A9 (1987)
- LAMBERT, D. L. Velocity Structure of Stellar Atmospheres: R Scuti. *David Mozurkewich, R. D. Gehrz, K. H. Hinkle, and D. L. Lambert*. **314**, 242, 30-F12 (1987)
- LAMBERT, DAVID L. Oxygen Isotopic Abundances in Evolved Stars. III. 26 Carbon Stars. *Michael J. Harris, David L. Lambert, Kenneth H. Hinkle, Bengt Gustafsson, and Kjell Eriksson*. **316**, 294, 53-B14 (1987)
- A Search for $^{13}\text{C}^{16}\text{O}$ in the Atmospheres of Evolved Stars. *Michael J. Harris and David L. Lambert*. **318**, 868, 90-D12 (1987)
- Neutron-Exposure Variations in MS and S Stars, and the Implications for s-Process Nucleosynthesis. *Verne V. Smith, David L. Lambert, and Andrew McWilliam*. **320**, 862, 119-C3 (1987)
- Further Observations of the He I 10830 Å Chromospheric Line in Stars. *David L. Lambert*. **65**, 255, 32-A1 (1987) (Abstr. in **320**, 936, 120-B1)
- LAMERS, H. J. G. L. M. The "SEI" Method for Accurate and Efficient Calculations of Line Profiles in Spherically Symmetric Stellar Winds. *H. J. G. L. M. Lamers, M. Cerruti-Sola, and M. Perinotto*. **314**, 726, 37-E6 (1987)
- High-Resolution Ultraviolet Observations of Interstellar Lines toward ξ Persei Observed with the Balloon-borne Ultraviolet Spectrometer. *Theodore P. Snow, H. J. G. L. M. Lamers, and Charles L. Joseph*. **321**, 952, 135-A2 (1987)
- LAMONTAGNE, R. Studies of Hot B Subdwarfs. V. Continuing Investigation of the C, N, and Si Abundance Patterns in the Atmospheres of sdB Stars. *R. Lamontagne, F. Wesemael, and G. Fontaine*. **318**, 844, 90-C1 (1987)
- LAMONTAGNE, ROBERT. An Eight-Year Spectroscopic Orbit for the WC7 + O4 Wolf-Rayet Binary HD 193793: Toward Solving the Mystery of the Infrared Outbursts. *Anthony F. Moffat, Robert Lamontagne, Peredur M. Williams, Jiri Horn, and Wilhelm Seggewiss*. **312**, 807, 11-F8 (1987)
- LANDECKER, T. L. VRO 42.05.01: A Supernova Remnant Reenergizing an Interstellar Cavity. *S. Pineault, T. L. Landecker, and D. Routledge*. **315**, 580, 47-A10 (1987)
- LANDMAN, DONALD A. O 17774 Diagnostic for Quiescent Prominences. *Nancy S. Brickhouse and Donald A. Landman*. **313**, 463, 20-A13 (1987)
- LANDSMAN, W. B. IUE Observations of Hydrogen and Deuterium in the Local Interstellar Medium. *J. Murthy, R. C. Henry, H. W. Moos, W. B. Landsman, J. L. Linsky, A. Vidal-Madjar, and C. Gry*. **315**, 675, 48-A10 (1987)
- LANDSTREET, J. D. Magnetic Field Measurements of Helium-strong Stars. *David A. Bohlender, Douglas N. Brown, J. D. Landstreet, and Ian B. Thompson*. **323**, 325, 156-E8 (1987)
- LANDSTREET, JOHN D. The Evolution of the Magnetic Fields of Ap Stars: Magnetic Observations of Stars in the Scorpius-Centaurus Association. *Ian B. Thompson, Douglas N. Brown, and John D. Landstreet*. **64**, 219, 19-B11 (1987) (Abstr. in **315**, 732, 48-E13)
- LANE, ADAIR P. H₂O Masers in Circumstellar Envelopes. *Adair P. Lane, K. J. Johnston, P. F. Bowers, J. H. Spencer, and P. J. Diamond*. **323**, 756, 163-A8 (1987)
- LANE, M. C. Atmospheric Abundances of Classical Metallic-Line A Stars: The Visual Spectral Region. *M. C. Lane and John B. Lester*. **65**, 137, 29-D1 (1987) (Abstr. in **319**, 1013, 106-A11)
- LANEY, DAVE. Infrared Photometry and Spectroscopy of Supernova 1986g in NGC 5128-Centaurus A. *Jay A. Frogel, Brooke Gregory, Kimiaki Kawara, Dave Lane, M. M. Phillips, Don Terndrup, Frederick Vrba, and Albert E. Whitford*. **315**, L129, 49-E11 (1987)
- LANG, KENNETH R. Multiple Wavelength Microwave Observations of the RS Canum Venaticorum Stars UX Arietis, HR 1099, HR 5110, and II Pegasi. *Robert F. Willson and Kenneth R. Lang*. **312**, 278, 4-A2 (1987)
- VLA Observations of a Solar Noise Storm. *Kenneth R. Lang and Robert F. Willson*. **319**, 514, 98-G8 (1987)
- Simultaneous SMM Flat Crystal Spectrometer and Very Large Array Observations of Solar Active Regions. *Kenneth R. Lang, Robert F. Willson, Kermit L. Smith, and Keith T. Strong*. **322**, 1035, 151-C4 (1987)
- Solar Active Region Physical Parameters Inferred from a Thermal Cyclotron Line and Soft X-Ray Spectral Lines. *Kenneth R. Lang, Robert F. Willson, Kermit L. Smith, and Keith T. Strong*. **322**, 1044, 151-D3 (1987)
- LANGER, NORBERT. The Production of ^{26}Al in Supermassive Stars and the Gamma-Ray Line Flux from the Galactic Center. *Wolfgang Hillebrandt, Friedrich-Karl Thielemann, and Norbert Langer*. **321**, 761, 132-G7 (1987)
- LANGER, WILLIAM D. Filamentary Structure in the Orion Molecular Cloud. *John Bally, William D. Langer, Antony A. Stars, and Robert W. Wilson*. **312**, L45, 14-B12 (1987)
- The Structure and Dynamics of Bok Globule B335. *Margaret A. Frerking, William D. Langer, and Robert W. Wilson*. **313**, 320, 18-D10 (1987)
- Radio Observations of Carbon Monoxide toward Zeta Ophiuchi: Velocity Structure, Isotopic Abundances, and Physical Properties. *William D. Langer, Alfred E. Glassgold, and Robert W. Wilson*. **322**, 450, 142-G9 (1987)
- LANGMEIER, A. The Complex Cross-Spectra of Cygnus X-2 and GX 5-1. *M. van der Klis, G. Hasinger, L. Stella, A. Langmeier, J. van Paradijs, and W. H. G. Lewin*. **319**, L13, 100-B2 (1987)
- EXOSAT Observations of 4U 1705 - 44: Type I Bursts and Persistent Emission. *A. Langmeier, M. Stajano, G. Hasinger, J. Trümper, and M. Gottwald*. **323**, 288, 156-B13 (1987)
- LANGSTON, G. I. The Triple Radio Source 0023 + 171: A Candidate for a Dark Gravitational Lens. *J. N. Hewitt, E. L. Turner, C. R. Lawrence, D. P. Schneider, J. E. Gunn, C. L. Bennett, B. F. Burke, J. H. Mahoney, G. I. Langston, M. Schmidt, J. B. Oke, and J. G. Hoessel*. **321**, 706, 132-C5 (1987)
- LANZEROTTI, L. J. Experimental Study of Erosion of Methane Ice by Energetic Ions and Some Considerations for Astrophysics. *L. J. Lanzerotti, W. L. Brown, and K. J. Marcantonio*. **313**, 910, 26-F7 (1987)
- LANZETTA, KENNETH M. An Absorption-Line Survey of 32 QSOs at Red Wavelengths: Properties of the Mg II Absorbers. *Kenneth M. Lanzetta, David A. Turnshek, and Arthur M. Wolfe*. **322**, 739, 148-A2 (1987)
- LAROS, J. G. Gamma-Ray Burst Counterparts: Infrared. *Bradley E. Schaefer, T. L. Cline, U. Desai, B. J. Teegarden, J.-L. Atteia, C. Barat, K. Hurley, M. Niel, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, I. V. Estulin, and A. V. Kuznetsov*. **313**, 226, 17-D9 (1987)
- Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. *J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Kouveliotou, T. Cline, B. Dennis, U. Desai, and L. Orwig*. **320**, L105, 121-C7 (1987)
- A New Type of Repetitive Behavior in a High-Energy Transient. *J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Kouveliotou, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. **320**, L111, 121-C13 (1987)
- SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806 - 20. *C. Kouveliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Neil, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. **322**, L21, 145-B8 (1987)
- LASKARIDES, P. G. Theoretical Isochrones for Old, Super-Metal-rich Stars. *Don A. Vandenberg and P. G. Laskarides*. **64**, 103, 18-C9 (1987) (Abstr. in **312**, 965, 13-E6)
- LASKER, BARRY M. On the Distribution of Colors for Stars in the Ninth to Fifteenth Magnitude Range: Statistics and Implications for Galactic Structure. *Barry M. Lasker, Peter M. Garnavich, and Anne P. Reynolds*. **320**, 502, 115-A3 (1987)
- The Composite Image of Sanduleak - 69° 202, Candidate Precursor to Supernova 1978A in the Large Magellanic Cloud. *Nolan R. Walborn, Barry M. Lasker, Victoria G. Laidler, and You-Hua Chu*. **321**, L41, 129-E4 (1987)
- LASOTA, J. P. The Evolution of Magnetic Cataclysmic Variables. *J. M. Hameury, A. R. King, J. P. Lasota, and H. Ritter*. **316**, 275, 53-A9 (1987)
- LATHAM, DAVID W. The Baade-Wesselink Method and the Distances to

- RR Lyrae Stars. II. The Field Star X Arietis. *Rodney V. Jones, Bruce W. Carney, David W. Latham, and Robert L. Kurucz.* **312**, 254, 3-F5 (1987)
- The Baade-Wesselink Method and the Distances to RR Lyrae Stars. III. The Field Star SW Draconis. *Rodney V. Jones, Bruce W. Carney, David W. Latham, and Robert L. Kurucz.* **314**, 605, 36-B10 (1987)
- Rotational Velocities of Low-Mass Stars in the Hyades. *John R. Stauffer, Lee W. Hartmann, and David W. Latham.* **320**, L51, 114-D12 (1987)
- LATTANZIO, JOHN C. The Formation of a 1.5 M_{\odot} Carbon Star with $M_{\text{hel}} = -4.4$. *John C. Lattanzio.* **313**, L15, 21-B3 (1987)
- LATTER, WILLIAM B. The Rotationally Modulated Zeeman Spectrum at Nearly 10^9 Gauss of the White Dwarf PG 1031 + 234. *William B. Latter, Gary D. Schmidt, and Richard F. Green.* **320**, 308, 111-D9 (1987)
- Properties of Evolved Mass-losing Stars in the Milky Way and Variations in the Interstellar Dust Composition. *Harley A. Thronson, Jr., William B. Latter, John H. Black, John Bally, and Perry Hacking.* **322**, 770, 148-C5 (1987)
- LATTIMER, JAMES M. Neutrinos from SN 1987A. *Adam Burrows and James M. Lattimer.* **318**, L63, 92-C8 (1987)
- LAUGHLIN, K. B. Laboratory Measurement of the Pure Rotational Spectrum of Vibrationally Excited HCO^+ ($v = 1$) by Far-Infrared Laser Sideband Spectroscopy. *Geoffrey A. Blake, K. B. Laughlin, R. C. Cohen, Kerry L. Busarow, and R. J. Saykally.* **316**, L45, 56-D7 (1987)
- LAVERY, RUSSELL J. Multiaperture Spectroscopy of Galaxies in Abell 370. *J. Patrick Henry and Russell J. Lavery.* **323**, 473, 159-F9 (1987)
- LAWRENCE, A. The Continuum of Type 1 Seyfert Galaxies. I. A Single Form Modified by the Effects of Dust. *Martin Ward, Martin Elvis, G. Fabbiano, N. P. Carleton, S. P. Willner, and A. Lawrence.* **315**, 74, 40-F12 (1987)
- The Continuum of Type 1 Seyfert Galaxies. II. Separating Thermal and Nonthermal Components. *N. P. Carleton, Martin Elvis, G. Fabbiano, S. P. Willner, A. Lawrence, and Martin Ward.* **318**, 595, 87-D6 (1987)
- LAWRENCE, C. R. The Triple Radio Source 0023 + 171: A Candidate for a Dark Gravitational Lens. *J. N. Hewitt, E. L. Turner, C. R. Lawrence, D. P. Schneider, J. E. Gunn, C. L. Bennett, B. F. Burke, J. H. Mahoney, G. I. Langston, M. Schmidt, J. B. Oke, and J. G. Hoessel.* **321**, 706, 132-C5 (1987)
- LEA, SUSAN M. Radiation Gas Dynamics of Polar Cap Accretion onto Magnetized Neutron Stars: Basic Theory. *Jonathan Arons, Richard I. Klein, and Susan M. Lea.* **312**, 666, 10-C1 (1987)
- LEAHY, D. A. CO Observations of IRAS Sources with 11.3 Micron Silicon Carbide Dust Features. *D. A. Leahy, Sun Kwok, and R. A. Arquilla.* **320**, 825, 118-F13 (1987)
- Einstein IPC Imaging and Spectral Observations of the Supernova Remnant HB 9. *D. A. Leahy.* **322**, 917, 150-A1 (1987)
- LEARNED, J. G. see SVOBODA, R. et al.
- LEARNER, R. C. M. The Solar Boron Abundance. *R. C. M. Learner and C. J. Harris.* **320**, 926, 120-A3 (1987)
- LEBOFSKY, M. J. Color Evolution in High-Redshift Galaxies. *Peter R. M. Eisenhardt and M. J. Lebofsky.* **316**, 70, 50-F14 (1987)
- LEE, HYUNG MOK. Optical Properties of Interstellar Graphite and Silicate Grains: Erratum. *B. T. Draine and Hyung Mok Lee.* **318**, 485, 84-C4 (1987) (Orig. paper in **285**, 89, 111-A3)
- Evolution of Globular Clusters Including a Degenerate Component. *Hyung Mok Lee.* **319**, 772, 103-D13 (1987)
- Dynamical Effects of Successive Mergers on the Evolution of Spherical Stellar Systems. *Hyung Mok Lee.* **319**, 801, 103-F14 (1987)
- The Evolution and Final Disintegration of Spherical Stellar Systems in a Steady Galactic Tidal Field. *Hyung Mok Lee and Jeremiah P. Ostriker.* **322**, 123, 139-C6 (1987)
- LEE, MAN HOI. Thermal Emission from Bok Globules. *Man Hoi Lee and C. Rogers.* **317**, 197, 66-B8 (1987)
- LEE, SANG K. Laboratory Detection of HC_3NH^+ by Infrared Difference Frequency Laser Spectroscopy. *Sang K. Lee and T. Amano.* **323**, L145, 164-E4 (1987)
- LEIBOWITZ, ELIA M. Photometry of SS 433 over 7 Years: Study of Two Periodicities. *Tsevi Mazeh, James C. Kemp, Elia M. Leibowitz, Herbert Meninger, and Haim Mendelson.* **317**, 824, 75-A13 (1987)
- LEIGHTON, R. B. CO Emission from Centaurus A. *T. G. Phillips, B. N. Ellison, J. B. Keene, R. B. Leighton, R. J. Howard, C. R. Masson, D. B. Sanders, B. Veidt, and K. Young.* **322**, L73, 152-B8 (1987)
- LEISING, MARK D. Positron Annihilation Gamma Rays from Novae. *Mark D. Leising and Donald D. Clayton.* **323**, 159, 154-G4 (1987)
- LEITER, DARRYL. Constraints on Possible Precursor AGN Sources of the Cosmic X-Ray Background. *Elihu Boldt and Darryl Leiter.* **322**, L1, 145-A4 (1987)
- LEPAGE, T. J. The Radio Spectrum of Cyclopropene. *J. M. Vrtilak, C. A. Gottlieb, T. J. LePage, and P. Thaddeus.* **316**, 826, 61-B4 (1987)
- LEPP, S. Cosmic-Ray-induced Photodestruction of Interstellar Molecules in Dense Clouds. *A. Sternberg, A. Dalgarno, and S. Lepp.* **320**, 676, 117-B11 (1987)
- The Abundance of H_3^+ Ions in Dense Interstellar Clouds. *S. Lepp, A. Dalgarno, and A. Sternberg.* **321**, 383, 126-D4 (1987)
- Molecule Formation in Quasar Broad-Line Cloud Gas. *T. Kallman, S. Lepp, and P. Giovannoni.* **321**, 907, 134-D13 (1987)
- The C/CO Ratio in Dense Interstellar Clouds. *R. Gredel, S. Lepp, and A. Dalgarno.* **323**, L137, 164-D12 (1987)
- LESTER, D. F. Far-Infrared Measurements of N/O in H II Regions: Evidence for Enhanced CN Process Nucleosynthesis in the Inner Galaxy. *D. F. Lester, H. L. Dinerstein, M. W. Werner, D. M. Watson, R. Genzel, and J. W. V. Storey.* **320**, 573, 116-A1 (1987)
- Far-Infrared Continuum Emission from the Nucleus, Starburst, and Extended Spiral Arms of NGC 1068. *D. F. Lester, M. Joy, P. M. Harvey, H. B. Ellis, Jr., and P. S. Parmar.* **321**, 755, 132-G1 (1987)
- The 2 Micron Spectrum of L1551 IRS 5. *John S. Carr, P. M. Harvey, and D. F. Lester.* **321**, L71, 129-G7 (1987)
- LESTER, DANIEL F. Observations of Infrared Emission from a Fast-moving Knot in Cassiopeia A. *Harriet L. Dinerstein, Daniel F. Lester, David M. Rank, Michael W. Werner, and Diane H. Wooden.* **312**, 314, 4-C11 (1987)
- Far-Infrared Detection of a Circumstellar Dust Torus around Sharpless 106. *Paul M. Harvey, Daniel F. Lester, and Marshall Joy.* **316**, L75, 62-C5 (1987)
- Infrared Emission from Young Stars in the Nucleus of M82. *Marshall Joy, Daniel F. Lester, and Paul M. Harvey.* **319**, 314, 96-D5 (1987)
- LESTER, JOHN B. Atmospheric Abundances of Classical Metallic-Line A Stars: The Visual Spectral Region. *M. C. Lane and John B. Lester.* **65**, 137, 29-D1 (1987) (Abstr. in **319**, 1013, 106-A11)
- LETAW, JOHN R. Distributed Reacceleration of Cosmic Rays. *Amri Wandel, David Eichler, John R. Letaw, Rein Silberberg, and C. H. Tsao.* **316**, 676, 59-D13 (1987)
- Can Distributed Acceleration Explain the Cosmic-Ray ^{15}N Abundance? *John R. Letaw.* **317**, L69, 78-C3 (1987)
- LEUNG, KAM-CHING. Analysis of the Evolved Contact System V367 Cygni. *Yan-Feng Li and Kam-Ching Leung.* **313**, 801, 25-E3 (1987)
- LEVAN, P. D. IRAS Large-Beam and Ground-Based Small-Beam Measurements of the Unidentified 11.3 and [Ne II] 12.8 Micron Line Fluxes in the Starburst Galaxy M82. *P. D. LeVan and S. D. Price.* **312**, 592, 9-D1 (1987)
- LEVATO, HUGO. Stellar Multiplicity in the Scorpius-Centaurus Association. *Hugo Levato, Stella Malaroda, Nidia Morrell, and Gladys Solivella.* **64**, 487, 23-B8 (1987) (Abstr. in **315**, 731, 48-E12)
- LEVENTHAL, M. A New Constraint on the Galactic Plane ^{26}Al Distribution. *C. J. MacCallum, A. F. Hutters, P. D. Stang, and M. Leventhal.* **317**, 877, 75-F1 (1987)
- Galactic Center Positronium Fraction: Observations and Simulations. *B. L. Brown and M. Leventhal.* **319**, 637, 102-A1 (1987)
- LEVENTHAL, MARVIN. Prospects for Observations of Nucleosynthetic Gamma-Ray Lines and Continuum from SN 1987A. *Neil Gehrels, Crawford J. MacCallum, and Marvin Leventhal.* **320**, L19, 114-B10 (1987)
- Prospects for Gamma-Ray Line Observations of Individual Supernovae. *Neil Gehrels, Marvin Leventhal, and Crawford J. MacCallum.* **322**, 215, 140-C3 (1987)
- LEVIN, STEVE. Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. *George F. Smoot, Marc Bershadoun, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Whiteky.* **317**, L45, 78-A9 (1987)
- LEVISON, HAROLD F. Triaxial Scale-free Models of Highly Flattened Elliptical Galaxies with and without Massive Halos. *Harold F. Levison and Douglas O. Richstone.* **314**, 476, 34-F9 (1987)
- Observable Properties of E0 Triaxial Galaxies: A Test for Triaxiality. *Harold F. Levison.* **320**, L93, 121-B11 (1987)
- LEVREAU, R. M. The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. *R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Levrault.* **317**, 355, 67-F14 (1987)
- LEVREAU, RUSSELL M. Observations of Infrared Emission Lines and Radio Continuum Emission from Pre-Main-Sequence Objects. *Neal J. Evans II, Russell M. Levrault, S. Beckwith, and Mike Skrutskie.* **320**, 364, 112-A9 (1987)
- LEWIN, J. D. Feasibility of Cosmic Neutrino Detectors Based on Coherent Interaction with Superconductors. *P. F. Smith and J. D. Lewin.* **318**, 738, 89-A10 (1987)
- LEWIN, W. H. G. Correlation between Spectral State and Quasi-periodic Oscillation Parameters in GX 5-1. *M. van der Klis, F. Jansen, J. van Paradijs, W. H. G. Lewin, M. Sztajno, and J. Trümper.* **313**, L19, 21-B7 (1987)
- EXOSAT Observations of 4U/MXB 1636 - 53: On the Relation

- between the Amount of Accreted Fuel and the Strength of an X-Ray Burst. *W. H. G. Lewin, W. Penninx, J. van Paradijs, E. Damen, M. Sztajno, J. Trümper, and M. van der Klis*. **319**, 893, 104-F9 (1987)
- The Complex Cross-Spectra of Cygnus X-2 and GX 5-1. *M. van der Klis, G. Hasinger, L. Stella, A. Langmeier, J. van Paradijs, and W. H. G. Lewin*. **319**, L13, 100-B2 (1987)
- Multipeaked X-Ray Bursts from 4U/MXB 1636 - 53: Evidence against Burst-induced Accretion Disk Coronae. *W. Penninx, J. van Paradijs, and W. H. G. Lewin*. **321**, L67, 129-G4 (1987)
- LEWIN, WALTER H. G. On the Theory of Type I X-Ray Bursts. The Energetics of Bursts and the Nuclear Fuel Reservoir in the Envelope. *Masayuki Y. Fujimoto, Mirek Sztajno, Walter H. G. Lewin, and Jan van Paradijs*. **319**, 902, 104-G5 (1987)
- LEWIS, B. M. H. I Survey of Face-on Galaxies: The Frequency of Distortions in H I Disks. *B. M. Lewis*. **63**, 515, 9-A5 (1987) (Abstr. in **313**, 928, 26-G11)
- LEWIS, D. Theoretical Non-Maxwellian Particle Velocity Distribution Functions for Spherically Symmetric Solar Wind-like Plasma Systems and Consequences. II. The Case of Large Thermal Anisotropy and Nine Moments Description for Each Species. *S. Cuperman, H. Yatom, M. Dryer, and D. Lewis*. **314**, 404, 32-E11 (1987)
- LEWIS, W. The Core Mass-Radius Relation for Giants: A New Test of Stellar Evolution Theory. *P. C. Joss, S. Rappaport, and W. Lewis*. **319**, 180, 95-A5 (1987)
- LI, HE-SHENG. The Formation of Current Sheets in the Solar Atmosphere. *Ellen G. Zweibel and He-Sheng Li*. **312**, 423, 5-D9 (1987)
- The Scattering of Alfvén Waves by Density Fluctuations. *He-Sheng Li and Ellen G. Zweibel*. **322**, 248, 140-E8 (1987)
- LI, YAN-FENG. Analysis of the Evolved Contact System V367 Cygni. *Yan-Feng Li and Kam-Ching Leung*. **313**, 801, 25-E3 (1987)
- LI, ZONG-WEI. Models for Type Ia Supernovae with Composition Inversions. *J. Craig Wheeler, Douglas Swartz, Zong-wei Li, and Peter G. Sutherland*. **316**, 733, 60-B5 (1987)
- LIANG, E. P. Inverse Comptonization by One-dimensional Relativistic Electrons. *E. Canfield, W. M. Howard, and E. P. Liang*. **323**, 565, 161-A1 (1987)
- LIBBRECHT, K. G. Is the Solar Oblateness Variable? Measurements of 1985. *R. H. Dicke, J. R. Kuhn, and K. G. Libbrecht*. **318**, 451, 83-G9 (1987)
- Observations of a Solar Latitude-dependent Limb Brightness Variation: Erratum. *J. R. Kuhn, K. G. Libbrecht, and R. H. Dicke*. **319**, 1010, 106-A8 (1987) (Orig. paper in **290**, 758, 32-C8)
- LICHENSTADT, I. The Effects of Neutrino Transport on the Collapse of Iron Stellar Cores. *E. S. Myra, S. A. Bludman, Y. Hoffman, I. Lichenstadt, N. Sack, and K. A. Van Riper*. **318**, 744, 89-B2 (1987)
- LIEB, ELLIOTT H. A Rigorous Examination of the Chandrasekhar Theory of Stellar Collapse. *Elliott H. Lieb and Horng-Tzer Yau*. **323**, 140, 154-E12 (1987)
- LIEBERT, JAMES. The Exotic Helium Variable PG 1346 + 082. *M. A. Wood, D. E. Winget, R. E. Nather, Frederic V. Hessman, James Liebert, Donald W. Kurtz, F. Wesemael, and G. Wegner*. **313**, 757, 25-B1 (1987)
- 1E 1048.5 + 5421: A New 114 Minute AM Herculis Binary. *Simon L. Morris, Gary D. Schmidt, James Liebert, John Stocke, Isabella M. Gioia, and Tommaso Maccaro*. **314**, 641, 36-E8 (1987)
- The DBA White Dwarf Stars in the Palomar-Green Sample. *Harry L. Shipman, James Liebert, and Richard F. Green*. **315**, 239, 42-E8 (1987)
- An Independent Method for Determining the Age of the Universe. *D. E. Winget, C. J. Hansen, James Liebert, H. M. Van Horn, G. Fontaine, R. E. Nather, S. O. Kepler, and D. Q. Lamb*. **315**, L77, 49-B1 (1987)
- BE Ursae Majoris: A Detached Binary with a Unique Reprocessing Spectrum. *Donald H. Ferguson, James Liebert, Roc Cutri, Richard F. Green, S. P. Willner, João E. Steiner, and Susan Tokarz*. **316**, 399, 54-D4 (1987)
- Extended Lyman- α Emission in 3C 326.1: A 100 Kiloparsec Cloud of Ionized Gas at a Redshift of 1.82. *Patrick J. McCarthy, Hyron Spinrad, S. Djorgovski, Michael A. Strauss, Wil van Breugel, and James Liebert*. **319**, L39, 107-B2 (1987)
- CAL 83: A Puzzling X-Ray Source in the Large Magellanic Cloud. *David Crampton, A. P. Cowley, J. B. Hutchings, Paul C. Schmidtke, I. B. Thompson, and James Liebert*. **321**, 745, 132-F3 (1987)
- Further Observations of the Peculiar Hot Helium-rich Degenerate KPD 0005 + 5106. *Ronald A. Downes, Edward M. Sion, James Liebert, and J. B. Holberg*. **321**, 943, 134-G7 (1987)
- A Search for Pulsating Stars Similar to PG 1159 - 035 and K1-16. *Albert D. Grauer, Howard E. Bond, James Liebert, Thomas A. Fleming, and Richard F. Green*. **323**, 271, 156-A10 (1987)
- LIEBING, D. F. Sporadic and Periodic 10-1000 TeV Gamma Rays From Cygnus X-3. *R. M. Baltrusaitis, G. L. Cassidy, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebing, C. P. Lingle, E. C. Loh, P. Sokolsky, P. Sommers, and D. Steck*. **323**, 685, 162-C1 (1987)
- LIESKE, J. H. Detection of Neutral Oxygen and Sulfur Emissions near Io Using IUE. *G. E. Ballester, H. W. Moos, P. D. Feldman, D. F. Strobel, M. E. Summers, J.-L. Bertaux, T. E. Skinner, M. C. Festou, and J. H. Lieske*. **319**, L33, 100-D1 (1987)
- LIGHT, LUANN BROWN. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. *John D. Anderson, Timothy P. Krisher, Susan E. Borutski, Michael J. Connally, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen*. **323**, L141, 164-E1 (1987)
- LIGHTFOOT, JOHN. Fluorescent Molecular Hydrogen Emission from the Reflection Nebula NGC 2023. *Ian Gatley, Tetsuo Hasegawa, Hiroko Suzuki, Ron Garden, Peter Brand, John Lightfoot, William Glencross, Haruyuki Okuda, and Tetsuya Nagata*. **318**, L73, 92-D4 (1987)
- LIGHTMAN, ALAN P. Effects of Electron-Positron Pair Opacity for Spherical Accretion onto Black Holes. *Alan P. Lightman, Andrzej A. Zdziarski, and Martin J. Rees*. **315**, L113, 49-D8 (1987)
- Pair Production and Compton Scattering in Compact Sources and Comparison to Observations of Active Galactic Nuclei. *Alan P. Lightman and Andrzej A. Zdziarski*. **319**, 643, 102-A7 (1987)
- LILLER, WILLIAM. BVI CCD Photometry of 47 Tucanae. *Gonzalo Alcaino and William Liller*. **319**, 304, 96-C9 (1987)
- LILLY, S. J. The Reddening of Cygnus A from a Measurement of Paschen-Alpha. *S. J. Lilly and G. J. Hill*. **315**, L103, 49-C12 (1987)
- LIN, D. N. C. The Formation of the Exponential Disk in Spiral Galaxies. *D. N. C. Lin and J. E. Pringle*. **320**, L87, 121-B6 (1987)
- LIN, R. P. High Spectral Resolution Measurements of a Solar Flare Hard X-Ray Burst. *R. P. Lin and R. A. Schwartz*. **312**, 462, 6-A1 (1987)
- LIN, ZUO. The Integrated Ultraviolet Radiation Field from QSOs. *Jill Bechtold, Ray J. Weymann, Zuo Lin, and Matthew A. Malkan*. **315**, 180, 42-A4 (1987)
- LINDBLOM, LEE. The Effect of Viscosity on Neutron Star Oscillations. *Curt Cutler and Lee Lindblom*. **314**, 234, 30-F4 (1987)
- The Role of the Viscous Secular Instability in Rotating Neutron Stars. *Lee Lindblom*. **317**, 325, 67-D9 (1987)
- LINDGREN, BO. The Near-Infrared Spectrum of the FeH Molecule. *John G. Phillips, Sumner P. Davis, Bo Lindgren, and Walter J. Balfour*. **65**, 721, 39-F2 (1987) (Abstr. in **322**, 1077, 151-G3)
- LINDSEY, C. Submillimeter Diagnostics of the Response of the Solar Chromosphere to Compressional Waves. *C. Lindsey and T. Roellig*. **313**, 877, 26-D1 (1987)
- LTE Modeling of Inhomogeneous Chromospheric Structure Using High-Resolution Limb Observation. *C. Lindsey*. **320**, 893, 119-E9 (1987)
- A Solar Chromosphere and Spicule Model Based on Far-Infrared Limb Observations. *D. Braun and C. Lindsey*. **320**, 898, 119-E11 (1987)
- LINFIELD, ROGER. VLB1 Observations of the 3C 111 Jet. *Roger Linfield*. **317**, 121, 65-C7 (1987)
- LING, J. C. Gamma-Ray Burst Localization by HEAO 3. *R. A. Schwartz, J. C. Ling, W. A. Mahoney, and A. S. Jacobson*. **317**, 846, 75-C7 (1987)
- Long-Term Gamma-Ray Spectral Variability of Cygnus X-1. *J. C. Ling, W. A. Mahoney, Wm. A. Wheaton, and A. S. Jacobson*. **321**, L117, 137-B8 (1987)
- LINGENFELTER, R. E. Positrons from Accelerated Particle Interactions. *B. Kozlowsky, R. E. Lingenfelter, and R. Ramaty*. **316**, 801, 60-G6 (1987)
- Calculated Gamma-Ray Line Fluxes from the Type II Supernova 1987A. *K. W. Chan and R. E. Lingenfelter*. **318**, L51, 92-B12 (1987)
- A Determination of the $^3\text{He}/\text{H}$ Ratio in the Solar Photosphere from Flare Gamma-Ray Line Observations. *X.-M. Hua and R. E. Lingenfelter*. **319**, 555, 99-C14 (1987)
- Solar Flare Neutron and Accelerated Ion Angular Distributions. *X.-M. Hua and R. E. Lingenfelter*. **323**, 779, 163-C8 (1987)
- LINGLE, C. P. Sporadic and Periodic 10-1000 TeV Gamma Rays From Cygnus X-3. *R. M. Baltrusaitis, G. L. Cassidy, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebing, C. P. Lingle, E. C. Loh, P. Sokolsky, P. Sommers, and D. Steck*. **323**, 685, 162-C1 (1987)
- LINNELL, ALBERT P. A New Method to Optimize Parameters in Solutions of Eclipsing Binary Light Curves. *Josef Kallrath and Albert P. Linnell*. **313**, 346, 18-F11 (1987)
- The Problem of the W-Type Light Curves of W Ursae Majoris. *Albert P. Linnell*. **316**, 389, 54-C8 (1987)
- MR Cygni Revisited. *Albert P. Linnell and Josef Kallrath*. **316**, 754, 60-C12 (1987)
- LINSKY, J. L. X-Ray Sources in Regions of Star Formation. II. The

- The Pre-Main-Sequence G Star HDE 283572. *F. M. Walter, A. Brown, J. L. Linsky, A. E. Rydgren, F. Vrba, M. Roth, L. Carrasco, P. F. Chugainov, N. I. Shakovskaya, and C. L. Imhoff.* **314**, 297, 31-D2 (1987)
- IUE Observations of Hydrogen and Deuterium in the Local Interstellar Medium. *J. Murthy, R. C. Henry, H. W. Moos, W. B. Landsman, J. L. Linsky, A. Vidal-Madjar, and C. Gry.* **315**, 675, 48-A10 (1987)
- LINSKY, JEFFREY L. The Discovery of Nonthermal Radio Emission from Magnetic Bp-Ap Stars. *Stephen A. Drake, David C. Abbott, T. S. Bastian, J. H. Bieging, E. Churchwell, G. Dulk, and Jeffrey L. Linsky.* **322**, 902, 149-F10 (1987)
- LIPANI, N. A. The X-Ray Spectrum of Markarian 509 Observed by EXOSAT. *M. Morini, N. A. Lipani, and D. Molteni.* **317**, 145, 65-E3 (1987)
- LIPPMANN, S. A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. *M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengston, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan.* **313**, 920, 26-G3 (1987)
- Laboratory Study of the Spectrum of Highly Ionized Calcium in the 100–250 Å Range Applied to Solar Flare Diagnostics. *S. Lippmann, M. Finkenthal, L. K. Huang, H. W. Moos, B. C. Stratton, T. L. Yu, A. K. Bhatia, and W. L. Hodge.* **316**, 819, 61-A11 (1987)
- LIS, DARIUSZ C. 1300 Micron Continuum Observations of the Sagittarius B2 Molecular Cloud Core. *Paul F. Goldsmith, Ronald L. Snell, and Dariusz C. Lis.* **313**, L5, 21-A8 (1987)
- LITES, B. W. Stokes Profile Analysis and Vector Magnetic Fields. III. Extended Temperature Minima of Sunspot Umbrae as Inferred from Stokes Profiles of Mg I $\lambda 4571$. *B. W. Lites, A. Skumanich, D. E. Rees, G. A. Murphy, and M. Carlsson.* **318**, 930, 91-B6 (1987)
- Stokes Profile Analysis and Vector Magnetic Fields. I. Inversion of Photospheric Lines. *A. Skumanich and B. W. Lites.* **322**, 473, 143-B8 (1987)
- The Polarization Properties of Model Sunspots: The Broad-Band Polarization Signature of the Schlüter-Temesváry Representation. *A. Skumanich and B. W. Lites.* **322**, 483, 143-C4 (1987)
- LITES, BRUCE W. Simultaneous Measurements of Sunspot Umbral Oscillations in the Photosphere, Chromosphere, and Transition Region. *John H. Thomas, Bruce W. Lites, Joseph B. Gurman, and Edwin F. Ladd.* **312**, 457, 5-G9 (1987)
- LITTLE, BLANE. Distant Satellites as Probes of Our Galaxy's Mass Distribution. *Blane Little and Scott Tremaine.* **320**, 493, 114-G6 (1987)
- LITTLE-MARENIN, IRENE R. A Water Maser Associated with EU Andromedae: A Carbon Star Near an Oxygen-rich Circumstellar Shell. *Priscilla J. Benson and Irene R. Little-Marenin.* **316**, L37, 56-C13 (1987)
- LIVINGSTON, W. Solar Luminosity Variation. V. The Photospheric Lines 1976–1985. *W. Livingston and L. Wallace.* **314**, 808, 38-D8 (1987)
- LIVIO, MARIO. The Nature of the Recurrent Novae. *Ronald F. Webbink, Mario Livio, James W. Truran, and Marina Orio.* **314**, 653, 36-F9 (1987)
- Spin-up and Mixing in Accreting White Dwarfs. *Mario Livio and James W. Truran.* **318**, 316, 82-C12 (1987)
- Massive Disk Formation from the Collision of a Main-Sequence Star with a White Dwarf in a Globular Cluster Core. *Noam Soker, Oded Regev, Mario Livio, and Michael M. Shara.* **318**, 760, 89-C4 (1987)
- Binary System Parameters and the Hibernation Models of Cataclysmic Variables. *Mario Livio and Michael M. Shara.* **319**, 819, 104-A4 (1987)
- The Period Distribution and Evolution of Short-Period Cataclysmic Variables. *Brian Warner and Mario Livio.* **322**, L95, 152-C14 (1987)
- LO, K. Y. Molecular Gas in the Starburst Nucleus of M82. *K. Y. Lo, K. W. Cheung, C. R. Masson, T. G. Phillips, S. L. Scott, and D. P. Woody.* **312**, 574, 9-B7 (1987)
- Molecular Spiral Structure in M51. *K. Y. Lo, R. Ball, C. R. Masson, T. G. Phillips, S. Scott, and D. P. Woody.* **317**, L63, 78-B11 (1987)
- CO Maps of the OMC-1 Outflow. *C. R. Masson, K. Y. Lo, T. G. Phillips, A. I. Sargent, N. Z. Scoville, and D. P. Woody.* **319**, 446, 98-A11 (1987)
- LOCKWOOD, G. W. Spectrophotometry of Epsilon Aurigae. *D. T. Thompson, B. L. Lutz, G. W. Lockwood, and J. R. Sowell.* **321**, 450, 127-B1 (1987)
- The Activity, Variability, and Rotation of Lower Main-Sequence Hyades Stars. *Richard R. Radick, D. T. Thompson, G. W. Lockwood, D. K. Duncan, and W. E. Baggett.* **321**, 459, 127-B10 (1987)
- LOCKWOOD, J. A. Interplanetary Radial Cosmic-Ray Gradients and Their Implication for a Possible Large Modulation Effect at the Heliospheric Boundary. *W. R. Webber and J. A. Lockwood.* **317**, 534, 69-F11 (1987)
- LOEWENSTEIN, MICHAEL. Evolution of Hot Galactic Flows. *Michael Loewenstein and William G. Mathews.* **319**, 614, 101-F4 (1987)
- LOEWENSTEIN, R. F. Dust Reradiation from M43. *J. Smith, D. A. Harper, and R. F. Loewenstein.* **314**, 76, 28-G7 (1987)
- LOH, E. C. Sporadic and Periodic 10–1000 TeV Gamma Rays From Cygnus X-3. *R. M. Baltrusaitis, G. L. Cassidy, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebing, C. P. Lingle, E. C. Loh, P. Sokolsky, P. Sommers, and D. Steck.* **323**, 685, 162-C1 (1987)
- LOKEN, C. Anisotropic Radiation Fields Produced by Scattering in Thick Accretion Disks. *J. Madej, C. Loken, and R. N. Henriksen.* **312**, 652, 10-A13 (1987)
- LOMBARDI, G. G. Absolute Oscillator Strengths for 108 Lines of Si I between 163 and 410 Nanometers. *Peter L. Smith, M. C. E. Huber, G. P. Tozzi, H. E. Griesinger, B. L. Cardon, and G. G. Lombardi.* **322**, 573, 144-B12 (1987)
- LONDON, RICHARD A. Time-dependent Calculations of X-Ray and γ Reprocessing. *Lynn R. Cominsky, Richard A. London, and Richard I. Klein.* **315**, 162, 41-F14 (1987)
- LONGMORE, A. J. Milliarsecond Resolution Infrared Observations of Young Stars in Taurus and Ophiuchus. *M. Simon, R. R. Howell, A. J. Longmore, B. A. Wilking, D. M. Peterson, and W.-P. Chen.* **320**, 344, 111-G3 (1987)
- LONGMORE, ANDREW J. Infrared Spectroscopy of the Supernova Remnant IC 443. *James R. Graham, Gillian S. Wright, and Andrew J. Longmore.* **313**, 847, 26-A7 (1987)
- LONSDALE, CAROL J. The IRAS Bright Galaxy Sample. II. The Sample and Luminosity Function. *B. T. Soifer, D. B. Sanders, B. F. Madore, G. Neugebauer, G. E. Danielson, J. H. Elias, Carol J. Lonsdale, and W. L. Rice.* **320**, 238, 110-F7 (1987)
- LOPEZ PIÑEIRO, A. Vibration-Rotational Intensities for the $X^1\Sigma^+$ State of Al H and Al D. *R. H. Tipping, A. Lopez Piñeiro, and C. Chackerian, Jr.* **323**, 810, 163-E12 (1987)
- LOREN, R. B. L1689N: Misalignment between a Bipolar Outflow and a Magnetic Field. *Alwyn Wootten and R. B. Loren.* **317**, 220, 66-D1 (1987)
- LOSECCO, J. M. see SVOBODA, R. et al.
- LOU, Y. Q. A Computational Code for Two-dimensional Unsteady Magnetohydrodynamics by the Method of Characteristics. *Y. Q. Lou, R. Rosner, and P. Ulmschneider.* **315**, 349, 43-F6 (1987)
- Nonlinear Magnetohydrodynamic Waves in a Steady Zonal Circulation for a Shallow Fluid Shell on the Surface of a Rotating Sphere. *Y. Q. Lou.* **322**, 862, 149-C4 (1987)
- LOVELACE, R. V. E. Self-collimated Electromagnetic Jets from Magnetized Accretion Disks. *R. V. E. Lovelace, J. C. L. Wang, and M. E. Sulkkanen.* **315**, 504, 46-C1 (1987)
- LOW, B. C. Static Current-Sheet Models of Quiescent Prominences. *F. Wu and B. C. Low.* **312**, 431, 5-E3 (1987)
- Electric Current Sheet Formation in a Magnetic Field Induced by Continuous Magnetic Footpoint Displacements. *B. C. Low.* **323**, 358, 157-A1 (1987)
- LOW, F. J. A Study of a Flux-limited Sample of IRAS Galaxies. *Beverly J. Smith, S. G. Kleinmann, J. P. Huchra, and F. J. Low.* **318**, 161, 80-F5 (1987)
- LUCAS, ROBERT. The Rich Molecular Spectrum and the Rapid Outflow of OH 231.8 + 4.2. *Mark Morris, Stéphane Guilloteau, Robert Lucas, and Alain Omont.* **321**, 888, 134-C8 (1987)
- LUCCHINI, F. Multipole Anisotropies of the Cosmic Background Radiation and Inflationary Models. *R. Fabbri, F. Lucchin, and S. Matarrese.* **315**, 1, 40-A7 (1987)
- LUCCHINI, FRANCESCO. Optical Bias and Hierarchical Clustering. *Silvio A. Bonometto, Francesco Lucchin, and Sabino Matarrese.* **323**, 19, 153-C6 (1987)
- LUCIANI, J. F. On the Antonov Criterion for Gravothermal Instability. *J. F. Luciani and R. Pellat.* **317**, 241, 66-E8 (1987)
- LUCK, R. EARLE. Nitrogen and Sulfur Overabundances in the Population II Supergiant HD 46703. *Howard E. Bond and R. Earle Luck.* **312**, 203, 3-B10 (1987)
- LUGGER, PHYLLIS M. CCD Photometry of Globular Cluster Core Structure. I. NGC 6388, NGC 6624, and M15—One Flat Core and Two Cusps. *Phyllis M. Lugger, Haldan Cohn, Jonathan E. Grindlay, Charles D. Bailyn, and Paul Hertz.* **320**, 482, 114-F8 (1987)
- LUGTEN, J. B. Detection of Interstellar CH in the Far-Infrared. *Gordon J. Stacey, J. B. Lugten, and R. Genzel.* **313**, 859, 26-B9 (1987)
- Interpretation of Rotationally Excited Far-Infrared OH Emission in Orion-KL. *G. J. Melnick, R. Genzel, and J. B. Lugten.* **321**, 530, 127-G10 (1987)
- Submillimeter and Far-Infrared Spectroscopy of M17 and S106: UV-Heated, Quiescent Molecular Gas? *A. I. Harris, J. Stutzki, R. Genzel, J. B. Lugten, G. J. Stacey, and D. T. Jaffe.* **322**, L49, 145-D6 (1987)
- LUHN, A. Calculation of the Mean Equilibrium Charges of Energetic Ions

- after Passin, through a Hot Plasma. *A. Luhn and D. Hovestadt*. **317**, 8-2, 75-D1 (1987)
- The Mean Ionic Charge of Silicon in ³He-rich Solar Flares. *A. Luhn, B. Klecker, D. Hovestadt, and E. Möbius*. **317**, 951, 76-E2 (1987)
- LUNINE, JONATHAN I. Evolution and Infrared Spectra of Brown Dwarfs: Erratum. *Jonathan I. Lunine, William B. Hubbard, and Mark S. Marley*. **316**, 473, 55-B13 (1987) (Orig. paper in **310**, 238, 134-F2)
- LUTTERMOSER, DONALD G. Ultraviolet Spectra and Chromospheres of Cool Carbon Stars. *Hollis R. Johnson and Donald G. Luttermoser*. **314**, 329, 31-F9 (1987)
- LUTZ, B. L. Spectrophotometry of Epsilon Aurigae. *D. T. Thompson, B. L. Lutz, G. W. Lockwood, and J. R. Sowell*. **321**, 450, 127-B1 (1987)
- LUTZ, BARRY L. Fluorescence Efficiency Factors for Ionized Water Vapor. *Barry L. Lutz*. **315**, L147, 49-G2 (1987)
- Ground-based Constraints on the H₂O⁺/CO⁺ Abundance Ratio and Dust Impact Rate in Comet P/Giacobini-Zinner: Comparison with the ICE Spacecraft Results. *R. Mark Wagner, Barry L. Lutz, and S. Wyckoff*. **322**, 544, 143-G9 (1987)
- LYNCH, DAVID K. Airborne Spectrophotometry of Eta Carinae from 4.5 to 7.5 Microns and a Model for Source Morphology. *Ray W. Russell, David K. Lynch, John A. Hackwell, Richard J. Rudy, George S. Rossano, and M. W. Castelar*. **321**, 937, 134-G1 (1987)
- LYNDEN-BELL, DONALD. Spectroscopy and Photometry of Elliptical Galaxies. I. New Distance Estimator. *Alan Dressler, Donald Lynden-Bell, David Burstein, Roger L. Davies, S. M. Faber, Roberto Terlevich, and Gary Wegner*. **313**, 42, 15-D7 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies: A Large-Scale Streaming Motion in the Local Universe. *Alan Dressler, S. M. Faber, David Burstein, Roger L. Davies, Donald Lynden-Bell, R. J. Terlevich, and Gary Wegner*. **313**, L37, 27-A9 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies. II. The Spectroscopic Parameters. *Roger L. Davies, David Burstein, Alan Dressler, S. M. Faber, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner*. **64**, 581, 26-B1 (1987) (Abstr. in **318**, 944, 91-C9)
- Spectroscopy and Photometry of Elliptical Galaxies. III. UBV Aperture Photometry, CCD Photometry, and Magnitude-related Parameters. *David Burstein, Roger L. Davies, Alan Dressler, S. M. Faber, Remington P. S. Stone, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner*. **64**, 601, 26-C7 (1987) (Abstr. in **318**, 944, 91-C9)
- MA, C. P. The Evolutionary Status of 4U 1820 - 30. *S. Rappaport, L. A. Nelson, C. P. Ma, and P. C. Joss*. **322**, 842, 149-A12 (1987)
- MACALPINE, GORDON M. Emission-Line Galaxies in the Bootes Void. *J. Ward Moody, Robert P. Kirshner, Gordon M. MacAlpine, and Stephen A. Gregory*. **314**, L33, 39-A13 (1987)
- MACCACARO, T. 1E 0116.3 - 0116: A Peculiar, X-Ray-Bright, Early-Type Galaxy. *D. Maccagni, I. M. Gioia, T. Maccacaro, R. E. Schild, and J. T. Stocke*. **316**, 132, 51-D6 (1987)
- X-Ray and Optical Observations of X-Ray-Selected BL Lacertae Objects. *P. Giommi, P. Barr, B. Garilli, I. M. Gioia, T. Maccacaro, D. Maccagni, and R. E. Schild*. **322**, 662, 146-A10 (1987)
- MACCACARO, TOMMASO. 1E 1048.5 + 5421: A New 114 Minute AM Herculis Binary. *Simon L. Morris, Gary D. Schmidt, James Liebert, John Stocke, Isabella M. Gioia, and Tommaso Maccacaro*. **314**, 641, 36-E8 (1987)
- X-Ray-Selected AGNs near Bright Galaxies. *John T. Stocke, Peter Schneider, Simon L. Morris, Isabella M. Gioia, Tommaso Maccacaro, and Rudolph E. Schild*. **315**, L11, 45-A14 (1987)
- MACCAGNI, D. 1E 0116.3 - 0116: A Peculiar, X-Ray-Bright, Early-Type Galaxy. *D. Maccagni, I. M. Gioia, T. Maccacaro, R. E. Schild, and J. T. Stocke*. **316**, 132, 51-D6 (1987)
- X-Ray and Optical Observations of X-Ray-Selected BL Lacertae Objects. *P. Giommi, P. Barr, B. Garilli, I. M. Gioia, T. Maccacaro, D. Maccagni, and R. E. Schild*. **322**, 662, 146-A10 (1987)
- MACCALLUM, CRAWFORD J. Prospects for Observations of Nucleosynthetic Gamma-Ray Lines and Continuum from SN 1987A. *Neil Gehrels, Crawford J. MacCallum, and Marvin Leventhal*. **320**, L19, 114-B10 (1987)
- Prospects for Gamma-Ray Line Observations of Individual Supernovae. *Neil Gehrels, Marvin Leventhal, and Crawford J. MacCallum*. **322**, 215, 140-C3 (1987)
- MACCULLUM, C. J. A New Constraint on the Galactic Plane ²⁶Al Distribution. *C. J. MacCallum, A. F. Hutters, P. D. Stang, and M. Leventhal*. **317**, 877, 75-F1 (1987)
- MACGREGOR, K. B. Winds from Rotating, Magnetic, Hot Stars. III. The Azimuthal Velocity and Magnetic Force. *K. B. MacGregor and D. B. Friend*. **312**, 659, 10-B6 (1987)
- MACHADO, M. E. Evidence for Gentle Chromospheric Evaporation during the Gradual Phase of Large Solar Flares. *B. Schmieder, T. G. Forbes, J. M. Malherbe, and M. E. Machado*. **317**, 956, 76-E8 (1987)
- MACKENTY, JOHN W. Extended Emission-Line Regions around QSOs. *Alan Stockton and John W. MacKenty*. **316**, 584, 58-D3 (1987)
- MACKEY, WILLIE R. The Light of the Supernova Outburst. IV. Lowered Energy for the Echo Model. *Willie R. Mackey*. **315**, 251, 42-F6 (1987)
- MACKLIN, R. L. Maxwellian-averaged Neutron Capture Cross Sections for ⁹⁹Tc and ⁹⁵⁻⁹⁸Mo. *R. R. Winters and R. L. Macklin*. **313**, 808, 25-E10 (1987)
- MACLEOD, J. M. Observations of OCS and a Search for OC₃S in the Interstellar Medium. *H. E. Matthews, J. M. MacLeod, N. W. Broten, S. C. Madden, and P. Friberg*. **315**, 646, 47-F7 (1987)
- MADDALENA, RONALD J. An Expanding System of Molecular Clouds Surrounding λ Orionis. *Ronald J. Maddalena and Mark Morris*. **323**, 179, 155-A10 (1987)
- MADDEN, S. C. Observations of OCS and a Search for OC₃S in the Interstellar Medium. *H. E. Matthews, J. M. MacLeod, N. W. Broten, S. C. Madden, and P. Friberg*. **315**, 646, 47-F7 (1987)
- MADEJ, J. Anisotropic Radiation Fields Produced by Scattering in Thick Accretion Disks. *J. Madej, C. Loken, and R. N. Henriksen*. **312**, 652, 10-A13 (1987)
- The Impact of the Pressure Shift of Hydrogen Lines on "Relativistic" Masses of White Dwarfs. *B. Grabowski, J. Madej, and J. Halenka*. **313**, 750, 25-A8 (1987)
- MADORE, B. F. The IRAS Bright Galaxy Sample. II. The Sample and Luminosity Function. *B. T. Soifer, D. B. Sanders, B. F. Madore, G. Neugebauer, G. E. Danielson, J. H. Elias, Carol J. Lonsdale, and W. L. Rice*. **320**, 238, 110-F7 (1987)
- MADORE, BARRY F. Near-Infrared Observations of Cepheids: The Distance to NGC 300. *Barry F. Madore, Douglas L. Welch, C. W. McAlary, and R. A. McLaren*. **320**, 26, 108-C4 (1987)
- Distance Moduli and Structure of the Magellanic Clouds from Near-Infrared Photometry of Classical Cepheids. *Douglas L. Welch, Robert A. McLaren, Barry F. Madore, and Christopher W. McAlary*. **321**, 162, 124-A7 (1987)
- The Luminosity-Velocity Diagram: A New Distance Estimator for Spiral Galaxies? *Barry F. Madore and David Woods*. **323**, L25, 158-B13 (1987)
- MADSEN, JES. On the Applicability of the Statistical Mechanical Theories of Violent Relaxation. *Jes Madsen*. **316**, 497, 57-D9 (1987)
- MAGGIO, A. Variability Analysis in Low Count Rate Sources. *A. Collura, A. Maggio, S. Sciortino, S. Serio, G. S. Vaiana, and R. Rosner*. **315**, 340, 43-E11 (1987)
- Einstein Observatory Survey of X-Ray Emission from Solar-Type Stars: The Late F and G Dwarf Stars. *A. Maggio, S. Sciortino, G. S. Vaiana, P. Majer, J. Bookbinder, L. Golub, F. R. Harnden, Jr., and R. Rosner*. **315**, 687, 48-B8 (1987)
- MAHONEY, J. H. The Triple Radio Source 0023 + 171: A Candidate for a Dark Gravitational Lens. *J. N. Hewitt, E. L. Turner, C. R. Lawrence, D. P. Schneider, J. E. Gunn, C. L. Bennett, B. F. Burke, J. H. Mahoney, G. I. Langston, M. Schmidt, J. B. Oke, and J. G. Hoessel*. **321**, 706, 132-C5 (1987)
- MAHONEY, M. J. VLA Observations of the Fast Pulsar Candidate in M28. *W. C. Erickson, M. J. Mahoney, R. H. Becker, and D. J. Helfand*. **314**, L45, 39-B9 (1987)
- MAHONEY, W. A. Gamma-Ray Burst Localization by HEAO 3. *R. A. Schwartz, J. C. Ling, W. A. Mahoney, and A. S. Jacobson*. **317**, 846, 75-C7 (1987)
- Long-Term Gamma-Ray Spectral Variability of Cygnus X-1. *J. C. Ling, W. A. Mahoney, Wm. A. Wheaton, and A. S. Jacobson*. **321**, L117, 137-B8 (1987)
- MAJER, P. Einstein Observatory Survey of X-Ray Emission from Solar-Type Stars: The Late F and G Dwarf Stars. *A. Maggio, S. Sciortino, G. S. Vaiana, P. Majer, J. Bookbinder, L. Golub, F. R. Harnden, Jr., and R. Rosner*. **315**, 687, 48-B8 (1987)
- MAKINO, F., et al. Simultaneous Multifrequency Observations of the BL Lacertae Object Markarian 421. *F. Makino, Y. Tanaka, M. Matsuoka, K. Koyama, H. Inoue, K. Makishima, R. Hoshi, S. Hayakawa, Y. Kondo, C. M. Urry, S. L. Mufson, K. R. Hackney, R. L. Hackney, S. Kikuchi, Y. Mikami, W. Z. Wisniewski, N. Hiromoto, M. Nishida, J. Burnell, P. Brand, P. M. Williams, M. G. Smith, F. Takahara, M. Inoue, M. Tsuboi, H. Tabara, T. Kato, M. F. Aller, and H. D. Aller*. **313**, 662, 24-A12 (1987)
- MAKISHIMA, K. see MAKINO, F., et al.
- MAKISHIMA, K. Spectra and Pulse Period of the Binary X-Ray Pulsar 4U 1538 - 52. *K. Makishima, K. Koyama, S. Hayakawa, and F. Nagase*. **314**, 619, 36-C10 (1987)
- A Scanning Modulation Collimator Observation of the High Energy X-Ray Source in the Crab Nebula. *R. M. Pelling, W. S. Paciesas, L. E. Peterson, K. Makishima, M. Oda, Y. Ogawara, and S. Miyamoto*. **319**, 416, 97-F7 (1987)
- MALAGOLI, A. On the Thermal Instability of Galactic and Cluster Halos.

- A. Malagoli, R. Rosner, and G. Bodo. **319**, 622, 101-G8 (1987)
- MALANEY, ROBERT A. On the Origin of the Solar System *s*-Process Abundances. Robert A. Malaney and Arnold I. Boothroyd. **320**, 866, 119-C7 (1987)
- The *s*-Process Nucleosynthesis of Barium Stars. Robert A. Malaney. **321**, 832, 133-E13 (1987)
- MALARODA, STELLA. Stellar Multiplicity in the Scorpius-Centaurus Association. Hugo Levato, Stella Malaroda, Nidia Morrell, and Gladys Solivella. **64**, 487, 23-B8 (1987) (Abstr. in **315**, 731, 48-E12)
- MALEY, PAUL D. Specular Satellite Reflection and the 1985 March 19 Optical Outburst in Perseus. Paul D. Maley. **317**, L39, 71-C11 (1987)
- The Perseus Flasher and Satellite Glints. Bradley E. Schaefer, Michael Barber, John J. Brooks, Allen DeForrest, Paul D. Maley, Norman W. McLeod III, Russ McNiel, Andrew J. Noymer, A. K. Presnell, Richard Schwartz, and Scott Whitney. **320**, 398, 112-D2 (1987)
- MALHERBE, J. M. Evidence for Gentle Chromospheric Evaporation during the Gradual Phase of Large Solar Flares. B. Schmieder, T. G. Forbes, J. M. Malherbe, and M. E. Machado. **317**, 956, 76-E8 (1987)
- MALKAN, M. A. Broad-Band Properties of the CFA Seyfert Galaxies. II. Infrared to Millimeter Properties. R. A. Edelson, M. A. Malkan, and G. H. Rieke. **321**, 233, 124-G1 (1987)
- Far-Infrared Variability in Active Galactic Nuclei. R. A. Edelson and M. A. Malkan. **323**, 516, 160-B14 (1987)
- MALKAN, MATTHEW A. The Integrated Ultraviolet Radiation Field from QSOs. Jill Bechtold, Ray J. Weymann, Zuo Lin, and Matthew A. Malkan. **315**, 180, 42-A4 (1987)
- PG 1411 + 442: The Nearest Broad Absorption Line Quasar. Matthew A. Malkan, Richard F. Green, and John B. Hutchings. **322**, 729, 147-G6 (1987)
- MALONEY, PHILIP. Observations of 1.3 Millimeter Emission from the Centers of Galaxies. Harley A. Thronson, Jr., Christopher K. Walker, Constance E. Walker, and Philip Maloney. **318**, 645, 88-A4 (1987)
- MAMON, G. A. Photochemistry and Molecular Ions in Oxygen-rich Circumstellar Envelopes. G. A. Mamon, A. E. Glassgold, and A. Omont. **323**, 306, 156-D3 (1987)
- MAMON, GARY A. The Dynamics of Small Groups of Galaxies. I. Virialized Groups. Gary A. Mamon. **321**, 622, 131-D2 (1987)
- MANDOLESI, N. Preliminary VLA Limits on the Sunyaev-Zel'dovich Effect in Abell 2218. R. B. Partridge, R. A. Perley, N. Mandolesi, and F. Delpino. **317**, 112, 65-B11 (1987)
- MANZO, G. Time Variability of Gamma Cassiopeiae in X-Rays. F. Frontera, D. Dal Fiume, N. R. Robba, G. Manzo, S. Re, and E. Costa. **320**, L127, 121-D13 (1987)
- MARAN, STEPHEN P. Physical Parameters for 12 Planetary Nebulae and Their Central Stars in the Magellanic Clouds. Lawrence H. Aller, Charles D. Keyes, Stephen P. Maran, Theodore R. Gull, Andrew G. Michalitsianos, and Theodore P. Stecher. **320**, 159, 109-F12 (1987)
- MARASCHI, L. The Redshift of the BL Lacertae Object PKS 2005-489. R. Falomo, L. Maraschi, E. G. Tanzi, and A. Treves. **318**, L39, 92-B1 (1987)
- MARASCHI, LAURA. A New Soft X-Ray Mode in the AM Herculis Object E2003 + 225. Julian P. Osborne, Klaus Beuermann, Philip Charles, Laura Maraschi, Koji Mukai, and Aldo Treves. **315**, L123, 49-E5 (1987)
- MARCAIDE, J. M. VLBI Observations of 23 Hot Spots in the Starburst Galaxy M82. N. Bartel, M. I. Ratner, A. E. E. Rogers, I. J. Shapiro, R. J. Bonometti, N. L. Cohen, M. V. Gorenstein, J. M. Marcaide, and R. A. Preston. **323**, 505, 160-B3 (1987)
- MARCAIDE, JON. Multipole VLBI Observations of 4C 39.25: Superluminal Motion and Stationary Structure. David B. Shaffer, Alan P. Marscher, Jon Marcaide, and Jonathan D. Romney. **314**, L1, 33-B4 (1987)
- MARCANTONIO, K. J. Experimental Study of Erosion of Methane Ice by Energetic Ions and Some Considerations for Astrophysics. L. J. Lanzetta, W. L. Brown, and K. J. Marcantonio. **313**, 910, 26-F7 (1987)
- MARCY, GEOFFREY W. The Pleiades Rapid Rotators: Evidence for an Evolutionary Sequence. R. Paul Butler, Ross D. Cohen, Douglas K. Duncan, and Geoffrey W. Marcy. **319**, L19, 100-B9 (1987)
- MARGOLIS, S. H. Cosmic Ray Propagation in the Galaxy and in the Heliosphere: The Path-Length Distribution at Low Energy. M. Garcia-Munoz, J. A. Simpson, T. G. Guzik, J. P. Wefel, and S. H. Margolis. **64**, 269, 19-F6 (1987) (Abstr. in **315**, 733, 48-E14)
- MARGOLIS, STEVEN H. Neutrino Emission by the Pair, Plasma, and Photo Processes in the Weinberg-Salam Model. Paul J. Schinder, David N. Schramm, Paul J. Witta, Steven H. Margolis, and David L. Tubbs. **313**, 531, 22-E9 (1987)
- MARGON, B. The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Leveault. **317**, 355, 67-F14 (1987)
- MARGON, BRUCE. The X-Ray Properties of High-Redshift Quasi-stellar Objects. Scott F. Anderson and Bruce Margon. **314**, 111, 29-B14 (1987)
- The Low-Luminosity X-Ray Sources in Omega Centauri. Bruce Margon and Michael Bolte. **321**, L61, 129-F11 (1987)
- MARIOTTI, J.-M. On the Binary Nature of Van Biesbroeck 8. C. Perrier and J.-M. Mariotti. **312**, L27, 7-B12 (1987)
- MARISKA, J. T. Nonlinear Evolution of Radiation-driven Thermally Unstable Fluids. R. B. Dahlburg, C. R. DeVore, J. M. Picone, J. T. Mariska, and J. T. Karpen. **315**, 385, 44-B5 (1987)
- A Numerical Study of the Nonlinear Thermal Stability of Solar Loops. J. A. Klimchuk, S. K. Antiochos, and J. T. Mariska. **320**, 409, 112-D13 (1987)
- MARISKA, JOHN T. Solar Transition Region and Coronal Response to Heating Rate Perturbations. John T. Mariska. **319**, 465, 98-C3 (1987)
- MARLEY, MARK S. Evolution and Infrared Spectra of Brown Dwarfs: Erratum. Jonathan I. Lunine, William B. Hubbard, and Mark S. Marley. **316**, 473, 55-B13 (1987) (Orig. paper in **310**, 238, 134-F2)
- MARR, J. Study of the H42 α (86 GHz) Recombination Line in W3(OH). Wm. J. Welch and J. Marr. **317**, L21, 71-B10 (1987)
- MARSCHER, ALAN P. Electromagnetic Cascades in the Magnetosphere of a Very Young Pulsar: A Model for the Positron Production near the Galactic Center. Apostolos Mastichiadis, Kenneth Brecher, and Alan P. Marscher. **314**, 88, 29-A5 (1987)
- Multipole VLBI Observations of 4C 39.25: Superluminal Motion and Stationary Structure. David B. Shaffer, Alan P. Marscher, Jon Marcaide, and Jonathan D. Romney. **314**, L1, 33-B4 (1987)
- 18 Centimeter VLBI Observations of the Quasar NRAO 140 during and after a Low-Frequency Outburst. Alan P. Marscher, John J. Broderick, Lucia Padrielli, Norbert Bartel, and Jonathan D. Romney. **319**, 456, 98-B8 (1987)
- Multifrequency VLBI Observations of 4C 39.25: A Superluminal Source without a Well-defined Core. Alan P. Marscher, David B. Shaffer, Roy S. Booth, and Barry J. Geldzahler. **319**, L69, 107-D7 (1987)
- MARSHALL, HERMAN L. The Radio Luminosity Function of Optically Selected Quasars. Herman L. Marshall. **316**, 84, 50-G14 (1987)
- MARTIC, M. Observation and Oscillatory Properties of Mesostuctures in the Solar Chromosphere. L. Damé and M. Martić. **314**, L15, 33-C2 (1987)
- MARTIN, M. C. Comet Halley: OH Absorption of Galactic Background Radio Sources. E. Bajaja, E. M. Arnal, J. C. Cerosimo, F. R. Colomb, M. C. Martin, J. Mazzaro, R. Morras, J. C. Olalde, W. G. L. Pöppel, A. M. Silva, I. F. Mirabel, and V. Boriakoff. **313**, 906, 26-F2 (1987)
- Observation of the OH 1667 MHz Line toward Comet Halley from the Southern Hemisphere. E. Bajaja, R. Morras, W. G. L. Pöppel, J. E. Cerosimo, M. C. Martin, J. Mazzaro, J. C. Olalde, A. Silva, E. M. Arnal, F. R. Colomb, I. F. Mirabel, and V. Boriakoff. **322**, 549, 144-A1 (1987)
- MARTIN, P. G. Excitation and Dissociation of Molecular Hydrogen in Shock Waves at Interstellar Densities. J. E. Dove, A. C. M. Rusk, P. H. Cribb, and P. G. Martin. **318**, 379, 83-A11 (1987)
- Supernova 1987A in the Large Magellanic Cloud: The Explosion of a ~ 20 M_{\odot} Star Which Has Experienced Mass Loss? S. E. Woosley, P. A. Pinto, P. G. Martin, and Thomas A. Weaver. **318**, 664, 88-B11 (1987)
- Carbon Grains in the Envelope of IRC +10216. P. G. Martin and C. Rogers. **322**, 374, 142-A1 (1987)
- MARTIN, ROBERT N. H₂O Maser Emission from the Nuclei of NGC 253 and M51. Paul T. P. Ho, Robert N. Martin, Christian Henkel, and Jean L. Turner. **320**, 663, 117-A12 (1987)
- Hot Gas in the Nucleus of IC 342: Detection of $J = 3-2$ CO Emission. Paul T. P. Ho, Jean L. Turner, and Robert N. Martin. **322**, L67, 152-B3 (1987)
- MARTINS, DONALD H. RICHFLD Photometry of NGC 6723. Donald H. Martins and Dorothy A. Fraquelli. **65**, 83, 28-G2 (1987) (Abstr. in **319**, 1012, 106-A10)
- MASHEDE, M. R. W. Ariel 6 Measurements of the Fluxes of Ultraheavy Cosmic Rays. P. H. Fowler, R. N. F. Walker, M. R. W. Masheder, R. T. Moses, A. Worley, and A. M. Gay. **314**, 739, 37-F7 (1987)
- MASON, G. M. A Multiplespacecraft Study of the Injection and Transport of Solar Energetic Particles. J. Beecik, G. M. Mason, D. C. Hamilton, G. Wibberenz, H. Kunow, D. Hoewstadt, and B. Klecker. **322**, 1052, 151-D14 (1987)
- MASSA, DERCK. Highly Ionized Interstellar Gas Located in the Galactic Disk and Halo. Blair D. Savage and Derck Massa. **314**, 380, 32-C11 (1987)
- MASSAGLIA, S. Current-driven Magnetohydrodynamic Thermal Instabilities in Sheared Fields. G. Bodo, A. Ferrari, S. Massaglia, and R. Rosner. **313**, 432, 19-F10 (1987)

- MASSEY, PHILIP. Are There Stellar Winds in the Hot Stars of M31? *J. B. Hutchings, Philip Massey, and L. Bianchi*. **322**, L79, 152-B13 (1987)
- An Atlas of Optical Spectrophotometry of Wolf-Rayet Carbon and Oxygen Stars. *Ana V. Torres and Philip Massey*. **65**, 459, 35-A2 (1987) (Abstr. in **321**, 1053, 136-A4)
- MASSI, M. Solar System-Sized Condensations in the Orion Nebula. *E. Churchwell, M. Felli, D. O. S. Wood, and M. Massi*. **321**, 516, 127-F11 (1987)
- MASSON, C. R. Molecular Gas in the Starburst Nucleus of M82. *K. Y. Lo, K. W. Cheung, C. R. Masson, T. G. Phillips, S. L. Scott, and D. P. Woody*. **312**, 574, 9-B7 (1987)
- Molecular Abundances in OMC-1: The Chemical Composition of Interstellar Molecular Clouds and the Influence of Massive Star Formation. *Geoffrey A. Blake, E. C. Sutton, C. R. Masson, and T. G. Phillips*. **315**, 621, 47-D9 (1987)
- Molecular Spiral Structure in M51. *K. Y. Lo, R. Ball, C. R. Masson, T. G. Phillips, S. Scott, and D. P. Woody*. **317**, L63, 78-B11 (1987)
- CO Maps of the OMC-1 Outflow. *C. R. Masson, K. Y. Lo, T. G. Phillips, A. I. Sargent, N. Z. Scoville, and D. P. Woody*. **319**, 446, 98-A11 (1987)
- Structure of a Possible Circumbinary Disk around T Tauri. *D. A. Weintraub, C. R. Masson, and B. Zuckerman*. **320**, 336, 111-F9 (1987)
- A Possible Protostar near HH 7-11. *E. N. Grossman, C. R. Masson, A. I. Sargent, N. Z. Scoville, S. Scott, and D. P. Woody*. **320**, 356, 112-A1 (1987)
- VLBI Structure of 3C 84 at 89 GHz. *D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman*. **322**, 74, 138-F11 (1987)
- CO Emission from Centaurus A. *T. G. Phillips, B. N. Ellison, J. B. Keene, R. B. Leighton, R. J. Howard, C. R. Masson, D. B. Sanders, B. Veidt, and K. Young*. **322**, L73, 152-B8 (1987)
- MASTICHIADIS, APOSTOLOS. Electromagnetic Cascades in the Magnetosphere of a Very Young Pulsar: A Model for the Positron Production near the Galactic Center. *Apostolos Mastichiadis, Kenneth Brecher, and Alan P. Marscher*. **314**, 88, 29-A5 (1987)
- MATARRESE, S. Multipole Anisotropies of the Cosmic Background Radiation and Inflationary Models. *R. Fabbri, F. Lucchin, and S. Matarrese*. **315**, 1, 40-A7 (1987)
- MATARRESE, SABINO. Optical Bias and Hierarchical Clustering. *Silvio A. Bonometto, Francesco Lucchin, and Sabino Matarrese*. **323**, 19, 153-C6 (1987)
- MATEO, MARIO. CCD Photometry of Large Magellanic Cloud Clusters. IV. The Metal-rich, Remote Southern Cluster LW 79. *Mario Mateo and Paul Hodge*. **320**, 626, 116-D14 (1987)
- Collapsed Cores and the Structural Parameters of Old Large Magellanic Cloud Star Clusters. *Mario Mateo*. **323**, L41, 158-C12 (1987)
- MATHEWS, G. J. The Quark-Hadron Phase Transition and Primordial Nucleosynthesis. *C. A. Alcock, G. M. Fuller, and G. J. Mathews*. **320**, 439, 114-C1 (1987)
- MATHEWS, WILLIAM G. Gas Clouds in Galactic Bulges. *William G. Mathews and Stephen D. Murray*. **312**, 66, 1-F12 (1987)
- Evolution of Hot Galactic Flows. *Michael Loewenstein and William G. Mathews*. **319**, 614, 101-F4 (1987)
- What Heats the Hot Phase in Active Nuclei? *William G. Mathews and Gary J. Ferland*. **323**, 456, 159-E6 (1987)
- MATHIEU, R. D. Near-Infrared and Optical Observations of IRAS Sources in and near Dense Cores. *P. C. Myers, Gary A. Fuller, R. D. Mathieu, C. A. Beichman, P. J. Benson, R. E. Schild, and J. P. Emerson*. **319**, 340, 96-F5 (1987)
- MATHIS, JOHN S. On the Chemical Homogeneity of the 30 Doradus H II Region and a Local Enrichment by Wolf-Rayet Stars. *Michael Rosa and John S. Mathis*. **317**, 163, 65-F11 (1987)
- MATOUSEK, STEVEN E. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. *John D. Anderson, Timothy P. Krisher, Susan E. Borutski, Michael J. Connally, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen*. **323**, L141, 164-E1 (1987)
- MATSAKIS, D. N. Evidence for Refractive Scintillation of Two Extragalactic Sources Seen through the Galactic Disk. *Brian Dennison, R. Fiedler, K. J. Johnston, J. H. Spencer, E. B. Waltman, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. **313**, 141, 16-E5 (1987)
- Daily Observations of Compact Extragalactic Radio Sources at 2695 and 8085 MHz, 1979-1985. *R. L. Fiedler, E. B. Waltman, J. H. Spencer, K. J. Johnston, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. **65**, 319, 33-A5 (1987) (Abstr. in **321**, 1050, 136-A1)
- MATSUMOTO, NORIYOSHI. Neutrino-Pair Bremsstrahlung in Dense Stars. IV. Phonon Contributions in the Crystalline Lattice Phase: Erratum. *Naoki Itoh, Yasuharu Kohyama, Noriyoshi Matsumoto, and Midori Seki*. **322**, 584, 144-C9 (1987) (Orig. paper in **285**, 304, 113-C2)
- MATSUOKA, M. see MAKINO, F., et al.
- MATTEI, JANET A. Detection of Superhumps and Quasi-periodic Oscillations in the Light Curve of the Dwarf Nova SW Ursae Majoris. *Edward L. Robinson, Allen W. Shafter, J. Allen Hill, Matt A. Wood, and Janet A. Mattei*. **313**, 772, 25-C2 (1987)
- MATTEUCCI, F. Subluminous Type I Supernovae: Their Theoretical Rate in Our Galaxy and in Ellipticals. *A. Tornambè and F. Matteucci*. **318**, L25, 85-B12 (1987)
- MATTHAEUS, W. H. Magnetic Helicity of the Parker Field. *J. W. Bieber, P. A. Evenson, and W. H. Matthaeus*. **315**, 700, 48-C7 (1987)
- MATTHEWS, H. E. Upper Limits to Interstellar PO. *H. E. Matthews, P. A. Feldman, and P. F. Bernath*. **312**, 358, 4-F14 (1987)
- Observations of OCS and a Search for OC₃S in the Interstellar Medium. *H. E. Matthews, J. M. MacLeod, N. W. Broten, S. C. Madden, and P. Friberg*. **315**, 646, 47-F7 (1987)
- MATTHEWS, J. see SVOBODA, R., et al.
- MATTHEWS, J. Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. *V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storch-Bergmann, and J. Matthews*. **320**, 589, 116-B3 (1987)
- MATTHEWS, JAYMIE M. The Rich p-Mode Spectrum of the Rapidly Oscillating Peculiar A Star HD 60435. *Jaymie M. Matthews, Donald W. Kurtz, and William H. Wehlau*. **313**, 782, 25-C12 (1987)
- On the Lack of Evidence for Nonradial Pulsation in Wolf-Rayet Stars. *Jaymie M. Matthews and Martin Beech*. **313**, L25, 21-B12 (1987)
- MATTHEWS, K. Continuum Energy Distributions of Quasars in the Palomar-Green Survey. *G. Neugebauer, R. F. Green, K. Matthews, M. Schmidt, B. T. Soifer, and J. Bennett*. **63**, 615, 10-A7 (1987) (Abstr. in **313**, 929, 26-G12)
- MAUCHE, CHRISTOPHER W. IUE Observations of the Dwarf Nova HL Canis Majoris and the Winds of Cataclysmic Variables. *Christopher W. Mauche and John C. Raymond*. **323**, 690, 162-C6 (1987)
- MAUROGORDATO, SOPHIE. Void Probabilities in the Galaxy Distribution: Scaling and Luminosity Segregation. *Sophie Maurogordato and Marc Lachièze-Rey*. **320**, 13, 108-B5 (1987)
- MAXWELL, OREN V. Neutrino Emission Processes in Hyperon-populated Neutron Stars. *Oren V. Maxwell*. **316**, 691, 59-E14 (1987)
- MAY, J. Molecular Clouds in the Carina Arm: Large-Scale Properties of Molecular Gas and Comparison with H I. *D. A. Grabelsky, R. S. Cohen, L. Bronfman, P. Thaddeus, and J. May*. **315**, 122, 41-D2 (1987)
- A Composite CO Survey of the Entire Milky Way. *T. M. Dame, H. Ungerechts, R. S. Cohen, E. J. de Geus, I. A. Grenier, J. May, D. C. Murphy, L.-A. Nyman, and P. Thaddeus*. **322**, 706, 147-D13 (1987)
- MAYLE, R. W. Resonant Neutrino Oscillations and Stellar Collapse. *G. M. Fuller, R. W. Mayle, J. R. Wilson, and D. N. Schramm*. **322**, 795, 148-E3 (1987)
- MAYLE, RON. Neutrinos from Gravitational Collapse. *Ron Mayle, James R. Wilson, and David N. Schramm*. **318**, 288, 82-A11 (1987)
- MAZA, J. IRAS 18059 - 3211: Optically Known As Gomez's Hamburger: Erratum. *M. T. Ruiz, V. Blanco, J. Maza, S. Heathcote, A. Phillips, K. Kawara, C. Anguita, M. Hamuy, and A. Gomez*. **320**, L157, 121-F14 (1987) (Orig. paper in **316**, L21, 56-B10)
- MAZA, JOSÉ. IRAS 1809 - 3211: Optically Known as "Gomez's Hamburger". *Maria Teresa Ruiz, Victor Blanco, José Maza, Steve Heathcote, Andrew Phillips, Kimiaki Kawara, Claudio Anguita, Mario Hamuy, and Arturo Gómez*. **316**, L21, 56-B10 (1987)
- MAZE, TSEVI. Photometry of SS 433 over 7 Years: Study of Two Periodicities. *Tsevi Maze, James C. Kemp, Elia M. Leibowitz, Herbert Meninger, and Haim Mendelson*. **317**, 824, 75-A13 (1987)
- MAZZALI, PAOLO A. The Ultraviolet Spectrum of Beta Lyrae. *Paolo A. Mazzali*. **65**, 695, 39-D1 (1987) (Abstr. in **322**, 1077, 151-G3)
- MAZZARO, J. Comet Halley: OH Absorption of Galactic Background Radio Sources. *E. Bajaja, E. M. Arnal, J. C. Cerosimo, F. R. Colomb, M. C. Martin, J. Mazzaro, R. Morras, J. C. Olalde, W. G. L. Poppel, A. M. Silva, I. F. Mirabel, and V. Boriakoff*. **313**, 906, 26-F2 (1987)
- Observation of the OH 1667 MHz Line toward Comet Halley from the Southern Hemisphere. *E. Bajaja, R. Morras, W. G. L. Poppel, J. E. Cerosimo, M. C. Martin, J. Mazzaro, J. C. Olalde, A. Silva, E. M. Arnal, F. R. Colomb, I. F. Mirabel, and V. Boriakoff*. **322**, 549, 144-A1 (1987)
- MCALARY, C. W. Near-Infrared Observations of Cepheids: The Distance to NGC 300. *Barry F. Madore, Douglas L. Welch, C. W. McAlary, and R. A. McLaren*. **320**, 26, 108-C4 (1987)
- MCALARY, CHRISTOPHER W. Distance Moduli and Structure of the

- Magellanic Clouds from Near-Infrared Photometry of Classical Cepheids. Douglas L. Welch, Robert A. McLaren, Barry F. Madore, and Christopher W. McAlary. **321**, 162, 124-A7 (1987)
- MCCABE, M. Simultaneous VLA Observations of a Flare at 6 and 20 Centimeter Wavelengths. T. Velusamy, M. R. Kundu, E. J. Schmahl, and M. McCabe. **319**, 984, 105-F4 (1987)
- MCCANN, S. M. Ne IX Emission-Line Ratios in Solar Active Regions. F. P. Keenan, D. L. McKenzie, S. M. McCann, and A. E. Kingston. **318**, 926, 91-B2 (1987)
- MCCARTHY, D. D. Evidence for Refractive Scintillation of Two Extragalactic Sources Seen through the Galactic Disk. Brian Dennison, R. Fiedler, K. J. Johnston, J. H. Spencer, E. B. Waltman, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis. **313**, 141, 16-E5 (1987)
- Daily Observations of Compact Extragalactic Radio Sources at 2695 and 8085 MHz, 1979-1985. R. L. Fiedler, E. B. Waltman, J. H. Spencer, K. J. Johnston, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis. **65**, 319, 33-A5 (1987) (Abstr. in **321**, 1050, 136-A1)
- MCCARTHY, D. W., JR. Direct Infrared Observations of the Very Low Mass Object Gliese 623B. D. W. McCarthy, Jr. and T. J. Henry. **319**, L93, 107-F3 (1987)
- MCCARTHY, P. Discovery of a Probable Binary Quasar. S. Djorgovski, R. Perley, G. Meylan, and P. McCarthy. **321**, L17, 129-C6 (1987)
- MCCARTHY, PATRICK J. Extended Lyman- α Emission in 3C 326.1: A 100 Kiloparsec Cloud of Ionized Gas at a Redshift of 1.82. Patrick J. McCarthy, Hyron Spinrad, S. Djorgovski, Michael A. Strauss, Wil van Breugel, and James Liebert. **319**, L39, 107-B2 (1987)
- A Correlation between the Radio and Optical Morphologies of Distant 3CR Radio Galaxies. Patrick J. McCarthy, Wil van Breugel, Hyron Spinrad, and S. Djorgovski. **321**, L29, 129-D3 (1987)
- MCCLURE, ROBERT D. Chemical Enrichment of Halo Protoclusters with Differing Stellar Mass Functions. Graeme H. Smith and Robert D. McClure. **316**, 206, 52-C3 (1987)
- Chemical Enrichment of Halo Protoclusters with Differing Stellar Mass Functions: Erratum. Graeme H. Smith and Robert D. McClure. **322**, 1074, 151-F12 (1987) (Orig. paper in **316**, 206, 52-C3)
- The Supernova Rate in Shapley-Ames Galaxies. Sidney van den Bergh, Robert D. McClure, and Robert Evans. **323**, 44, 153-E4 (1987)
- MCCLYMONT, A. N. Fast Downflows in the Solar Transition Region Explained. A. N. McClymont and I. J. D. Craig. **312**, 402, 5-C2 (1987)
- Why Coronal Loops Cannot Exist without Solar Gravity. I. J. D. Craig and A. N. McClymont. **318**, 421, 83-E5 (1987)
- MCCONNELL, M. L. Gamma-Ray Observations of the Crab Region Using a Coded-Aperture Telescope. M. L. McConnell, P. P. Dunphy, D. J. Forrest, E. L. Chupp, and A. Owens. **321**, 543, 128-A13 (1987)
- MCCOOK, G. P. Discovery of Optical Circular Polarization in Lambda Andromedae. J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook. **317**, L29, 71-C2 (1987)
- MCCOOK, GEORGE P. A Catalog of Spectroscopically Identified White Dwarfs. George P. McCook and Edward M. Sion. **65**, 603, 37-E2 (1987) (Abstr. in **322**, 1076, 151-G2)
- MCCRAY, RICHARD. Supershells and Propagating Star Formation. Richard McCray and Minas Kafatos. **317**, 190, 66-B1 (1987)
- Rapid Variability of P Cygni Lines in Massive X-Ray Binaries. Timothy R. Kallman, Richard McCray, and G. Mark Voit. **317**, 746, 74-B12 (1987)
- Inside Supernova 1987A. Richard McCray, J. Michael Shull, and Peter Sutherland. **317**, L73, 78-C7 (1987)
- MCCREIGHT, C. R. Structure in the Nucleus of NGC 1068 at 10 Microns. R. Tresch-Fienberg, G. G. Fazio, D. Y. Gezari, W. F. Hoffmann, G. M. Lamb, P. K. Shu, and C. R. McCreight. **312**, 542, 8-G2 (1987)
- MCDERMOTT, P. N. The Formation and Evolution of Tidal Binary Systems. Stephen L. W. McMillan, P. N. McDermott, and Ronald E. Taam. **318**, 261, 81-F11 (1987)
- Nonradial g-Mode Oscillations in X-Ray Bursting Neutron Stars. P. N. McDermott and Ronald E. Taam. **318**, 278, 82-A1 (1987)
- A Dynamical Instability Model for the Period Gap of Cataclysmic Variable Binary Systems. Ronald E. Taam and P. N. McDermott. **319**, L83, 107-E8 (1987)
- MCELOY, DOUGLAS B. The Shape of the Dark Halo in Polar-Ring Galaxies. Bradley C. Whitmore, Douglas B. McElroy, and François Schweizer. **314**, 439, 34-C9 (1987)
- MCFADDEN, LUCY-ANN. The Bare Nucleus of Comet Neujmin 1. Humberto Campins, Michael F. A'Hearn, and Lucy-Ann McFadden. **316**, 847, 61-D1 (1987)
- MCGREGOR, PETER J. CO Band Synthesis and the Interpretation of Band Strengths in Magellanic Cloud Supergiants. Peter J. McGregor. **312**, 195, 3-B2 (1987)
- MCHARDY, IAN. Is Optical Fe II Emission Related to the Soft X-Ray Properties of Quasars? Belinda J. Wilkes, Martin Elvis, and Ian McHardy. **321**, L23, 129-C12 (1987)
- MCKEE, CHRISTOPHER F. The Structure of Time-dependent Interstellar Shocks and Grain Destruction in the Interstellar Medium. Christopher F. McKee, David J. Hollenbach, C. Gregory Seab, and A. G. G. M. Tielens. **318**, 674, 88-C7 (1987)
- Shock Processing of Interstellar Dust: Diamonds in the Sky. A. G. G. M. Tielens, C. G. Seab, D. J. Hollenbach, and Christopher F. McKee. **319**, L109, 107-G6 (1987)
- Radio Recombination Lines from Fast Shocks in Molecular Clouds, with Application to Bipolar Flows. Christopher F. McKee and David J. Hollenbach. **322**, 275, 140-G7 (1987)
- MCKEEGAN, K. D. ^{16}O Excesses in Murchison and Murray Hibernites: A Case Against a Late Supernova Injection Origin of Isotopic Anomalies in O, Mg, Ca, and Ti. A. J. Fahey, J. N. Goswami, K. D. McKeegan, and E. K. Zinner. **323**, L91, 158-G5 (1987)
- MCKENZIE, D. L. Ne IX Emission-Line Ratios in Solar Active Regions. F. P. Keenan, D. L. McKenzie, S. M. McCann, and A. E. Kingston. **318**, 926, 91-B2 (1987)
- Properties of Solar Coronal Active Regions Deduced from X-Ray Line Spectra. D. L. McKenzie. **322**, 512, 143-E5 (1987)
- MCLAREN, R. A. Near-Infrared Observations of Cepheids: The Distance to NGC 300. Barry F. Madore, Douglas L. Welch, C. W. McAlary, and R. A. McLaren. **320**, 26, 108-C4 (1987)
- MCLAREN, ROBERT A. Distance Moduli and Structure of the Magellanic Clouds from Near-Infrared Photometry of Classical Cepheids. Douglas L. Welch, Robert A. McLaren, Barry F. Madore, and Christopher W. McAlary. **321**, 162, 124-A7 (1987)
- MCLEAN, A. D. A Detailed Investigation of Proposed Gas-Phase Syntheses of Ammonia in Dense Interstellar Clouds. Eric Herbst, D. J. DeFrees, and A. D. McLean. **321**, 898, 134-D4 (1987)
- Collisional Excitation of Interstellar Cyclopropenylidene. Sheldon Green, D. J. DeFrees, and A. D. McLean. **65**, 175, 29-F11 (1987) (Abstr. in **319**, 1013, 106-A11)
- MCLEAN, B. J. Radio Emission from FK Comae. V. A. Hughes and B. J. McLean. **313**, 263, 17-G5 (1987)
- MCLEOD, NORMAN W., III. The Perseus Flasher and Satellite Glints. Bradley E. Schaefer, Michael Barber, John J. Brooks, Allen DeForrest, Paul D. Maley, Norman W. McLeod III, Russ McNiel, Andrew J. Noymer, A. K. Presnell, Richard Schwartz, and Scott Whitney. **320**, 398, 112-D2 (1987)
- MCMAHON, RICHARD G. The Remarkable Broad Absorption Line QSO 0059 - 2735 with Extensive Fe II Absorption. C. Hazard, Richard G. McMahon, John K. Webb, and Donald C. Morton. **323**, 263, 156-A1 (1987)
- MCMILLAN, R. S. Evidence for Periodic Radial Velocity Variations in Arcturus. P. H. Smith, R. S. McMillan, and W. J. Merline. **317**, L79, 78-C12 (1987)
- MCMILLAN, S. L. W. Numerical Simulations of Adiabatic Axisymmetric Accretion Flow. I. A New Mechanism for the Formation of Jets. B. A. Fryxell, Ronald E. Taam, and S. L. W. McMillan. **315**, 536, 46-E5 (1987)
- MCMILLAN, STEPHEN L. W. The Formation and Evolution of Tidal Binary Systems. Stephen L. W. McMillan, P. N. McDermott, and Ronald E. Taam. **318**, 261, 81-F11 (1987)
- MCMAMARA, BERNARD J. Light Variability among the Late-Type B Pleiades Stars. Bernard J. McNamara. **312**, 778, 11-D7 (1987)
- MCMAN, RUSS. The Perseus Flasher and Satellite Glints. Bradley E. Schaefer, Michael Barber, John J. Brooks, Allen DeForrest, Paul D. Maley, Norman W. McLeod III, Russ McNiel, Andrew J. Noymer, A. K. Presnell, Richard Schwartz, and Scott Whitney. **320**, 398, 112-D2 (1987)
- MCMILLAN, ANDREW. Neutron-Exposure Variations in MS and S Stars, and the Implications for s-Process Nucleosynthesis. Verne V. Smith, David L. Lambert, and Andrew McWilliam. **320**, 862, 119-C3 (1987)
- MEAD, KATHRYN N. Molecular Clouds in the Outer Galaxy. I. Far-Infrared Observations. Kathryn N. Mead, Marc L. Kutner, Neal J. Eoans II, Paul M. Harvey, and Bruce A. Wilking. **312**, 321, 4-D4 (1987)
- MEATHERINGHAM, S. J. Angular Diameters and Fluxes of Magellanic Cloud Planetary Nebulae. II. High-Speed Direct Imaging. P. R. Wood, S. J. Meatheringham, M. A. Dopita, and D. H. Morgan. **320**, 178, 110-A11 (1987)
- The Ionization Effects of Shock Breakout in SN 1987A. M. A. Dopita, S. J. Meatheringham, P. Nulsen, and P. R. Wood. **322**, L85, 152-C5 (1987)
- MEATHERINGHAM, STEPHEN J. New Evolutionary Relationships for Magellanic Cloud Planetary Nebulae. Michael A. Dopita, Stephen J. Meatheringham, Peter R. Wood, B. Louise Webster, David H. Morgan, and Holland C. Ford. **315**, L107, 49-D2 (1987)

- MEECH, KAREN J. Surface Brightness Profiles of 10 Comets. *D. C. Jewitt and Karen J. Meech*. **317**, 992, 77-A7 (1987)
- MEIKLE, W. P. S. *IRAS* Observations of Collisionally Heated Dust in Large Magellanic Cloud Supernova Remnants. *James R. Graham, A. Evans, J. S. Albinson, M. F. Bode, and W. P. S. Meikle*. **319**, 126, 94-D5 (1987)
- MEISENHEIMER, KLAUS. A Bright Optical Synchrotron Counterpart of the Western Hot Spot in Pictor A. *Hermann-Josef Rösser and Klaus Meisenheimer*. **314**, 70, 28-G1 (1987)
- MELCHIORRI, F. The Large-Scale Anisotropies of the Extragalactic Infrared Background. *R. Fabbri, P. Andreani, F. Melchiorri, and B. Nisini*. **315**, 12, 40-B4 (1987)
- MELIA, FULVIO. Quasi-static Winds from Neutron Stars. *Paul C. Joss and Fulvio Melia*. **312**, 700, 10-E7 (1987)
- Multiphased X-Ray Bursts from 4U/MXB 1636 - 53: Evidence for Burst-induced Accretion Disk Coronae. *Fulvio Melia*. **315**, L43, 45-D12 (1987)
- Synchronization-induced Period Gaps and Ultra-Short Periods in Magnetic Cataclysmic Binaries. *D. Q. Lamb and Fulvio Melia*. **321**, L133, 137-C11 (1987)
- Dynamical Mass Transfer in Cataclysmic Binaries. *Fulvio Melia and D. Q. Lamb*. **321**, L139, 137-D2 (1987)
- MELNICK, G. J. Interpretation of Rotationally Excited Far-Infrared OH Emission in Orion-KL. *G. J. Melnick, R. Genzel, and J. B. Lugten*. **321**, 530, 127-G10 (1987)
- MELNICK, GARY J. H₂O Line Emission from Shocked Gas. *David A. Neufeld and Gary J. Melnick*. **322**, 266, 140-F12 (1987)
- MELOTT, ADRIAN L. A Quantitative Approach to the Topology of Large-Scale Structure. *J. Richard Gott III, David H. Weinberg, and Adrian L. Melott*. **319**, 1, 93-A7 (1987)
- The Topology of Large-Scale Structure. Topology and the Random Phase Hypothesis. *David H. Weinberg, J. Richard Gott III, and Adrian L. Melott*. **321**, 2, 122-A8 (1987)
- Comparisons of the Spatial Distribution of Abell Clusters against Models with Gaussian Initial Conditions. *David J. Batuski, Adrian L. Melott, and Jack O. Burns*. **322**, 48, 138-D12 (1987)
- MELOZZI, M. Microwave Observations of Flare Stars UV Ceti, AT Microscopii, and AU Microscopii. *M. R. Kundu, P. D. Jackson, S. M. White, and M. Melozzi*. **312**, 822, 12-A1 (1987)
- MELROSE, D. B. On the Controversy Concerning Turbulent Bremsstrahlung. *D. B. Melrose and J. Kuipers*. **323**, 338, 156-F7 (1987)
- MENDELSON, HAIM. Photometry of SS 433 over 7 Years: Study of Two Periodicities. *Tsevi Mazeh, James C. Kemp, Elia M. Leibowitz, Herbert Meninger, and Haim Mendelson*. **317**, 824, 75-A13 (1987)
- MENINGER, HERBERT. Photometry of SS 433 over 7 Years: Study of Two Periodicities. *Tsevi Mazeh, James C. Kemp, Elia M. Leibowitz, Herbert Meninger, and Haim Mendelson*. **317**, 824, 75-A13 (1987)
- MENYUK, C. R. Electron Cyclotron Harmonic Wave Acceleration. *H. Karimabadi, C. R. Menyuk, P. Sprangle, and L. Vlahos*. **316**, 462, 55-B2 (1987)
- MEREGHETTI, S. A Search for Millisecond Periodic and Quasi-periodic Pulsations in Low-Mass X-Ray Binaries. *S. Mergheiti and J. E. Grindlay*. **312**, 727, 10-G6 (1987)
- EXOSAT and Einstein Observations of the X-Ray Pulsar 4U 1145 - 619. *S. Mergheiti, G. F. Bignami, P. A. Caraveo, and A. Goldwurm*. **312**, 755, 11-B11 (1987)
- MERLINE, W. J. Evidence for Periodic Radial Velocity Variations in Arcturus. *P. H. Smith, R. S. McMillan, and W. J. Merline*. **317**, L79, 78-C12 (1987)
- MERRITT, DAVID. The Distribution of Dark Matter in the Coma Cluster. *David Merritt*. **313**, 121, 16-C13 (1987)
- Dynamical Instability of a Model of M87. *David Merritt*. **319**, 55, 93-E14 (1987)
- MERRITT, DONALD R. Identification of Lines in the Satellite Ultraviolet: The Spectrum of Tau Scorpii. *Charles R. Cowley and Donald R. Merritt*. **321**, 553, 128-B10 (1987)
- MÉSZÁROS, P. The Spectra of Accretion Disks and Their Application to Low-Mass X-Ray Binaries. *Ronald E. Taam and P. Mészáros*. **322**, 329, 141-D6 (1987)
- On the Radius of Neutron Stars. *P. Mészáros and H. Riffert*. **323**, L127, 164-D3 (1987)
- METCALF, THOMAS R. The H α Spectral Counterparts of Solar Hard X-Rays Microflares. *Richard C. Canfield and Thomas R. Metcalf*. **321**, 586, 128-E2 (1987)
- MEWALDT, R. A. A Reexamination of the Cosmic-Ray Helium Spectrum and the ³He/⁴He Ratio at High Energies. *W. R. Webber, R. L. Golden, and R. A. Mewaldt*. **312**, 178, 2-G13 (1987)
- MEYER, DAVID M. Observations of Weak C IV Absorption toward the QSOs 2000-330 and 2126-158. *David M. Meyer and Donald G. York*. **315**, L5, 45-A8 (1987)
- Observations of Ni II Absorption at $z = 2.811$ toward the QSO PKS 0582 - 250. *David M. Meyer and Donald G. York*. **319**, L45, 107-B13 (1987)
- MEYER, PETER. Cosmic-Ray Elemental Abundances from 1 to 10 GeV per AMU for Boron through Nickel. *Robert Dwyer and Peter Meyer*. **322**, 981, 150-E12 (1987)
- MEYLAN, G. Discovery of a Probable Binary Quasar. *S. Djorgovski, R. Perley, G. Meylan, and P. McCarthy*. **321**, L17, 129-C6 (1987)
- A Preliminary Survey of Collapsed Cores in the Magellanic Clouds' Globular Clusters. *G. Meylan and S. Djorgovski*. **322**, L91, 152-C10 (1987)
- MEYLAN, THOMAS. Spectroscopy of the Optical Photosphere of the Hot Pulsating Star BW Vulpeculae. *Ingemar Furenlid, Arthur Young, Thomas Meylan, Chester Haag, and Greg Crinklaw*. **319**, 264, 95-G9 (1987)
- MICHALITSIANOS, A. G. The Large-Scale Radio Structure of R Aquarii. *J. M. Hollis, M. Kafatos, A. G. Michalitsianos, R. J. Oliversen, and F. Yusef-Zadeh*. **321**, L55, 129-F6 (1987)
- MICHALITSIANOS, ANDREW G. Physical Parameters for 12 Planetary Nebulae and Their Central Stars in the Magellanic Clouds. *Lawrence H. Aller, Charles D. Keyes, Stephen P. Maran, Theodore R. Gull, Andrew G. Michalitsianos, and Theodore P. Stecher*. **320**, 159, 109-F12 (1987)
- MICHAUD, G. Selective Mass Loss, Abundance Anomalies, and Helium-rich Stars. *G. Michaud, J. Dupuis, G. Fontaine, and T. Montmerle*. **322**, 302, 141-B7 (1987)
- MICHEL, F. CURTIS. Pulsar Activation by the Interstellar Medium? *F. Curtis Michel*. **312**, 271, 3-G8 (1987)
- Electromagnetic Jets from Compact Objects. *F. Curtis Michel*. **321**, 714, 132-C13 (1987)
- A Pulsar Emission Model: Observational Tests. *F. Curtis Michel*. **322**, 822, 148-G2 (1987)
- MIDDLEDITCH, J. Optical Color, Polarimetric, and Timing Measurements of the 50 Millisecond Large Magellanic Cloud Pulsar, PSR 0540 - 69. *J. Middleditch, C. R. Pennypacker, and M. S. Burns*. **315**, 142, 41-E8 (1987)
- MIDDLEDITCH, JOHN. A Possible 1.13 Millisecond Periodicity in GX 339 - 4. *James N. Imamura, Thomas Y. Steiman-Cameron, and John Middleditch*. **314**, L11, 33-B13 (1987)
- Rapid Optical Flaring in MXB 1735 - 444 and an Optical Burst from GX 17 + 2. *James N. Imamura, Thomas Y. Steiman-Cameron, and John Middleditch*. **320**, L41, 114-D3 (1987)
- MIELBRECHT, RICHARD A. Duplicity among Stars with Strong Chromospheric Ca II Emission Lines: A Statistical Survey. *Arthur Young, Richard A. Mielbrecht, and Helmut A. Abt*. **317**, 787, 74-F1 (1987)
- MIHALAS, DIMITRI. Statistical Mechanics of Partially Ionized Stellar Plasmas: The Planck-Larkin Partition Function, Polarization Shifts, and Simulations of Optical Spectra. *Werner Däppen, Lawrence Anderson, and Dimitri Mihalas*. **319**, 195, 95-B6 (1987)
- MIKAMI, Y. see MAKINO, F., et al.
- MILGROM, MORDEHAI. Concerning the Limit on the Mean Mass Distribution of Galaxies from Their Gravitational Lens Effect. *Israel Kover and Mordehai Milgrom*. **321**, L113, 137-B5 (1987)
- MILLER, BRUCE N. Gravity in One Dimension: Selective Relaxation? *Charles J. Reidl, Jr. and Bruce N. Miller*. **318**, 248, 81-E10 (1987)
- MILLER, G. S. Deceleration of Infalling Plasma in the Atmospheres of Accreting Neutron Stars. I. Isothermal Atmospheres. *G. S. Miller, E. E. Salpeter, and I. Wasserman*. **314**, 215, 30-D13 (1987)
- MILONE, E. F. RW Comae Berenices. III. Light Curve Solution and Absolute Parameters. *E. F. Milone, R. E. Wilson, and B. J. Hrivnak*. **319**, 325, 96-E3 (1987)
- MIRABEL, I. F. Comet Halley: OH Absorption of Galactic Background Radio Sources. *E. Bajaja, E. M. Arnal, J. C. Cerosimo, F. R. Colomb, M. C. Martin, J. Mazzaro, R. Morras, J. C. Olalde, W. G. L. Pöppel, A. M. Silva, I. F. Mirabel, and V. Boriakoff*. **313**, 906, 26-F2 (1987)
- OH Outflows in Star-forming Regions. *I. F. Mirabel, A. Ruiz, L. F. Rodríguez, and J. Cantó*. **318**, 729, 89-A1 (1987)
- Observation of the OH 1667 MHz Line toward Comet Halley from the Southern Hemisphere. *E. Bajaja, R. Morras, W. G. L. Pöppel, J. E. Cerosimo, M. C. Martin, J. Mazzaro, J. C. Olalde, A. Silva, E. M. Arnal, F. R. Colomb, I. F. Mirabel, and V. Boriakoff*. **322**, 549, 144-A1 (1987)
- OH Megamasers in High-Luminosity *IRAS* Galaxies. *I. F. Mirabel and D. B. Sanders*. **322**, 688, 147-C8 (1987)
- MIRABEL, I. FELIX. The Peculiar Galaxy IC 4553. II. VLA Observations of the Neutral Hydrogen. *Willem A. Baan, J. H. van Gorkom, Joan T. Schmelz, and I. Felix Mirabel*. **313**, 102, 16-B7 (1987)
- MISKA, DOMINIQUE. Resonant Raman-Cyclotron Scattering in Very Strong Magnetic Fields. *Edouard Miska and Dominique Miska*. **317**, 282, 67-A7 (1987)
- MISKA, EDOUARD. Resonant Raman-Cyclotron Scattering in Very Strong Magnetic Fields. *Edouard Miska and Dominique Miska*. **317**, 282,

- 67-A7 (1987)
- MIYAJI, SHIGEKI. On the Collapse of 8-10 M_{\odot} Stars Due to Electron Capture. *Shigeki Miyaji and Ken'ichi Nomoto*. **318**, 307, 82-C2 (1987)
- MIYAJI, TAKESHI. Detection of Intense Unidentified Lines in TMC-1. Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito. **317**, L111, 78-E14 (1987)
- MIYAMA, SHOKEN M. The Equilibria of Rotating Isothermal Clouds. Masayoshi Kiguchi, Shinji Narita, Shoken M. Miyama, and Chushiro Hayashi. **317**, 830, 75-B5 (1987)
- MIYAMOTO, S. A Scanning Modulation Collimator Observation of the High Energy X-Ray Source in the Crab Nebula. R. M. Pelling, W. S. Paciesas, L. E. Peterson, K. Makishima, M. Oda, Y. Ogawara, and S. Miyamoto. **319**, 416, 97-F7 (1987)
- MIYAWAKI, R. The Bright-Rimmed Molecular Cloud around S140 IRS. II. Bipolar Outflow from S140 IRS 1. M. Hayashi, T. Hasegawa, T. Omodaka, S. S. Hayashi, and R. Miyawaki. **312**, 327, 4-D10 (1987)
- MÖBIUS, E. The Mean Ionic Charge of Silicon in ^3He -rich Solar Flares. A. Luhn, B. Klecker, D. Hovestadt, and E. Möbius. **317**, 951, 76-E2 (1987)
- MÖBIUS, EBERHARD. Diffusive Shock Acceleration: Comparison of a Unified Shock Model to Bow Shock Observations. Donald C. Ellison and Eberhard Möbius. **318**, 474, 84-B6 (1987)
- MOFFAT, A. F. J. Atmospheric Eclipses in the SMC Wolf-Rayet Eclipsing Binary HD 5980: The Heavy versus the Light Metal Abundance. G. Koenigsberger, A. F. J. Moffat, and L. H. Auer. **322**, L41, 145-C12 (1987)
- MOFFAT, ANTHONY F. An Eight-Year Spectroscopic Orbit for the WC7 + O4 Wolf-Rayet Binary HD 193793: Toward Solving the Mystery of the Infrared Outbursts. Anthony F. Moffat, Robert Lamontagne, Peredur M. Williams, Jiri Horn, and Wilhelm Seggewiss. **312**, 807, 11-F8 (1987)
- MOFFAT, ANTHONY F. J. The Wolf-Rayet Population in 30 Doradus and Its Surroundings. Anthony F. J. Moffat, Virpi S. Niemela, M. M. Phillips, You-hua Chu, and Wilhelm Seggewiss. **312**, 612, 9-E7 (1987)
- Wolf-Rayet Stars in the Andromeda Galaxy. Anthony F. J. Moffat and Michael M. Shara. **320**, 266, 111-A9 (1987)
- Polarization Variability among Wolf-Rayet Stars. I. Linear Polarization of a Complete Sample of Southern Galactic WC Stars. Nicole St-Louis, Laurent Drissen, Anthony F. J. Moffat, Pierre Bastien, and Santiago Tapia. **322**, 870, 149-C13 (1987)
- Polarization Variability among Wolf-Rayet Stars. II. Linear Polarization as a Complete Sample of Southern Galactic WN Stars. Laurent Drissen, Nicole St-Louis, Anthony F. J. Moffat, and Pierre Bastien. **322**, 888, 149-E5 (1987)
- MOFFET, A. T. VLBI Structure of 3C 84 at 89 GHz. D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman. **322**, 74, 138-F11 (1987)
- MOFFETT, THOMAS J. Observational Studies of Cepheids. VI. Period-Radius Relations. Thomas J. Moffett and Thomas G. Barnes III. **323**, 280, 156-B5 (1987)
- Observational Studies of Cepheids. V. Radial Velocities of Bright Cepheids. Thomas G. Barnes III, Thomas J. Moffett, and Mark H. Slovak. **65**, 307, 32-E1 (1987) (Abstr. in **320**, 937, 120-B2)
- MOK, YUNG. Alfvén Wave Dissipation in the Solar Atmosphere. G. Einaudi and Yung Mok. **319**, 520, 99-A1 (1987)
- MÖLLER, PALLE. $z_{\text{abs}} - z_{\text{em}}$ Absorption Systems in Quasar Spectra: A Correlation with Radio and Optical Luminosity? Palle Möller and Peter Jakobsen. **320**, L75, 121-A9 (1987)
- MOLTENI, D. The X-Ray Spectrum of Markarian 509 Observed by EXOSAT. M. Morini, N. A. Lipani, and D. Molteni. **317**, 145, 65-E3 (1987)
- MONIER, R. The X-Ray Spectrum of NGC 1068. R. Monier and J. P. Halpern. **315**, L17, 45-B6 (1987)
- MONTMERLE, T. Selective Mass Loss, Abundance Anomalies, and Helium-rich Stars. G. Michaud, J. Dupuis, G. Fontaine, and T. Montmerle. **322**, 302, 141-B7 (1987)
- MOODY, J. WARD. Emission-Line Galaxies in the Bootes Void. J. Ward Moody, Robert P. Kirshner, Gordon M. MacAlpine, and Stephen A. Gregory. **314**, L33, 39-A13 (1987)
- MOORE, R. L. Nonpotential Features Observed in the Magnetic Field of an Active Region. G. A. Gary, R. L. Moore, M. J. Hagyard, and Bernhard M. Haensch. **314**, 782, 38-B8 (1987)
- Microflares in the Solar Magnetic Network. J. G. Porter, R. L. Moore, E. J. Reichmann, E. Engold, and K. L. Harvey. **323**, 380, 157-C5 (1987)
- MOORE, RICHARD L. The Hiss of BL Lacertae. Richard L. Moore, Gary D. Schmidt, and Steven C. West. **314**, 176, 29-G10 (1987)
- MOOS, H. W. A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengtson, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan. **313**, 920, 26-G3 (1987)
- IUE Observations of Hydrogen and Deuterium in the Local Interstellar Medium. J. Murthy, R. C. Henry, H. W. Moos, W. B. Landsman, J. L. Linsky, A. Vidal-Madjar, and C. Gry. **315**, 675, 48-A10 (1987)
- Laboratory Study of the Spectrum of Highly Ionized Calcium in the 100-250 Å Range Applied to Solar Flare Diagnostics. S. Lippmann, M. Finkenthal, L. K. Huang, H. W. Moos, B. C. Stratton, T. L. Yu, A. K. Bhatia, and W. L. Hodge. **316**, 819, 61-A11 (1987)
- Detection of Neutral Oxygen and Sulfur Emissions near Io Using IUE. G. E. Ballester, H. W. Moos, P. D. Feldman, D. F. Strobel, M. E. Summers, J.-L. Bertaux, T. E. Skinner, M. C. Festou, and J. H. Lieske. **319**, L33, 100-D1 (1987)
- MORAN, J. M. VLBI Structure of 3C 84 at 89 GHz. D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman. **322**, 74, 138-F11 (1987)
- MORAN, JAMES M. Compact Continuum Radio Sources in the Orion Nebula. Guido Garay, James M. Moran, and Mark J. Reid. **314**, 535, 35-D2 (1987)
- Interaction of the High-Density Gas with the Bipolar Outflow in Cepheus A. José M. Torrelles, Paul T. P. Ho, Luis F. Rodriguez, Jorge Cantó, and James M. Moran. **321**, 884, 134-C4 (1987)
- MORBEY, C. L. On the Reality of Certain Spectroscopic Orbits. C. L. Morbey and R. F. Griffin. **317**, 343, 67-F1 (1987)
- MORFILL, G. Ultra-High Energy Cosmic Rays in a Galactic Wind and Its Termination Shock. J. R. Jokipii and G. Morfill. **312**, 170, 2-G5 (1987)
- MORFILL, G. E. Characteristics of Old Neutron Stars in Dense Interstellar Clouds. H. Böhringer, G. E. Morfill, and H. U. Zimmermann. **313**, 218, 17-D1 (1987)
- The Effects of Dust on the Propagation and Dissipation of Alfvén Waves in Interstellar Clouds. W. Pilipp, T. W. Hartquist, O. Hanes, and G. E. Morfill. **314**, 341, 37-G9 (1987)
- MORGAN, D. H. Angular Diameters and Fluxes of Magellanic Cloud Planetary Nebulae. II. High-Speed Direct Imaging. P. R. Wood, S. J. Meatheringham, M. A. Dopita, and D. H. Morgan. **320**, 178, 110-A11 (1987)
- MORGAN, DAVID H. New Evolutionary Relationships for Magellanic Cloud Planetary Nebulae. Michael A. Dopita, Stephen J. Meatheringham, Peter R. Wood, B. Louise Webster, David H. Morgan, and Holland C. Ford. **315**, L107, 49-D2 (1987)
- MORGAN, WM. LOWELL. Ion-Dipolar Molecule Rate Coefficients. Wm. Lowell Morgan and David R. Bates. **314**, 817, 38-E3 (1987)
- Ion-Dipolar Molecule Rate Coefficients: Erratum. Wm. Lowell Morgan and David R. Bates. **321**, 1049, 136-A1 (1987) (Orig. paper in **314**, 817, 38-E3)
- MORIARTY-SCHIEVEN, G. H. CS Observations of L1551: No Rotating Disk. G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, and G. L. Grassdale. **317**, L95, 78-D13 (1987)
- High-Resolution Images of the L1551 Bipolar Outflow: Evidence for an Expanding, Accelerated Shell. G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, F. P. Schloerb, K. M. Strom, and G. L. Grassdale. **319**, 742, 103-B6 (1987)
- MORIMOTO, MASAKI. Detection of Intense Unidentified Lines in TMC-1. Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito. **317**, L111, 78-E14 (1987)
- MORINI, M. The X-Ray Spectrum of Markarian 509 Observed by EXOSAT. M. Morini, N. A. Lipani, and D. Molteni. **317**, 145, 65-E3 (1987)
- MORITA, K.-I. High-Resolution Observations of CO from the Bipolar Nebula CRL 2688. R. Kawabe, M. Ishiguro, T. Kasuga, K.-I. Morita, N. Ukita, H. Kobayashi, S. Okumura, E. Fomalont, and N. Kaifu. **314**, 322, 31-F1 (1987)
- MORRAS, R. Comet Halley: OH Absorption of Galactic Background Radio Sources. E. Bajaja, E. M. Arnal, J. C. Cerosimo, F. R. Colomb, M. C. Martin, J. Mazzaro, R. Morras, J. C. Olalde, W. G. L. Pöppel, A. M. Silva, I. F. Mirabel, and V. Boriakoff. **313**, 906, 26-F2 (1987)
- Observation of the OH 1667 MHz Line toward Comet Halley from the Southern Hemisphere. E. Bajaja, R. Morras, W. G. L. Pöppel, J. E. Cerosimo, M. C. Martin, J. Mazzaro, J. C. Olalde, A. Silva, E. M. Arnal, F. R. Colomb, I. F. Mirabel, and V. Boriakoff. **322**, 549, 144-A1 (1987)
- MORRELL, NIDIA. Stellar Multiplicity in the Scorpius-Centaurus Association. Hugo Levato, Stella Malacoda, Nidia Morrell, and Gladys Solivella. **64**, 487, 23-B8 (1987) (Abstr. in **315**, 731, 48-E12)
- MORRIS, M. Structural Details of the Sagittarius A Complex: Evidence

- for a Large-Scale Poloidal Magnetic Field in the Galactic Center Region. *F. Yusef-Zadeh and M. Morris*. **320**, 545, 115-D12 (1987)
- MORRIS, MARK. An Unusual Radio Loop in the Edge-on Seyfert Galaxy NGC 5506. *Ann E. Wehrle and Mark Morris*. **313**, L43, 27-B1 (1987)
- The Rich Molecular Spectrum and the Rapid Outflow of OH 231.8 + 4.2. *Mark Morris, Stéphane Guilloteau, Robert Lucas, and Alain Omont*. **321**, 888, 134-C8 (1987)
- The Linear Filaments of the Radio Arc near the Galactic Center. *Farhad Yusef-Zadeh and Mark Morris*. **322**, 721, 147-F7 (1987)
- An Expanding System of Molecular Clouds Surrounding λ Orionis. *Ronald J. Maddalena and Mark Morris*. **323**, 179, 155-A10 (1987)
- MORRIS, SIMON L. 1E 1048.5 + 5421: A New 114 Minute AM Herculis Binary. *Simon L. Morris, Gary D. Schmidt, James Liebert, John Stocke, Isabella M. Gioia, and Tommaso Maccacaro*. **314**, 641, 36-E8 (1987)
- X-Ray-Selected AGNs near Bright Galaxies. *John T. Stocke, Peter Schneider, Simon L. Morris, Isabella M. Gioia, Tommaso Maccacaro, and Rudolph E. Schild*. **315**, L11, 45-A14 (1987)
- The Complex Absorption Spectrum of the Broad Absorption Line QSO 1303 + 308. *Craig B. Foltz, Ray J. Weymann, Simon L. Morris, and David A. Turnshek*. **317**, 450, 68-G10 (1987)
- MORROW, CHERILYNN A. Depth and Latitude Dependence of Solar Rotation. *Timothy M. Brown and Cheri Lynn A. Morrow*. **314**, L21, 33-C8 (1987)
- MORTON, DONALD C. The Remarkable Broad Absorption Line QSO 0059 - 2735 with Extensive Fe II Absorption. *C. Hazard, Richard G. McMahon, John K. Webb, and Donald C. Morton*. **323**, 263, 156-A1 (1987)
- MOSES, DAN. Jovian Electrons at 1 AU: 1978-1984. *Dan Moses*. **313**, 471, 20-B8 (1987)
- MOSES, R. T. Ariel 6 Measurements of the Fluxes of Ultraheavy Cosmic Rays. *P. H. Fowler, R. N. F. Walker, M. R. W. Masheder, R. T. Moses, A. Worley, and A. M. Gay*. **314**, 739, 37-F7 (1987)
- MOTCH, CHRISTIAN. The Optical Light Curve of the Low-Mass X-Ray Binary XB 1254 - 690. *Christian Motch, Holger Pedersen, Klaus Beuermann, Manfred W. Pakull, and Thierry J.-L. Courvoisier*. **313**, 792, 25-D8 (1987)
- MOULD, J. Isophotal Diameters of Cluster Spirals. *M. E. Cornell, M. Aaronson, G. Bothun, and J. Mould*. **64**, 507, 24-A5 (1987) (Abstr. in **317**, 1002, 77-B5)
- MOULD, J. R. The Age of the Large Magellanic Cloud Cluster NGC 2193. *G. S. Da Costa, Christopher R. King, and J. R. Mould*. **321**, 735, 132-E6 (1987)
- MOULD, JEREMY. The Evolution of Asymptotic Giant Branch Stars in the Magellanic Clouds. III. The Problem of Intermediate-Mass Stars. *Jeremy Mould and Neil Reid*. **321**, 156, 124-A1 (1987)
- The Stellar Populations of Shapley Constellation III. *Neill Reid, Jeremy Mould, and Ian Thompson*. **323**, 433, 159-C11 (1987)
- MOULD, JEREMY R. Sources of Error in the Tully-Fisher Relation: Reducing the Scatter with CCD *i*-Band Surface Photometry of Spiral Galaxies. *Gregory D. Bothun and Jeremy R. Mould*. **313**, 629, 23-F1 (1987)
- MOYD, KATHERINE I. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. *John D. Anderson, Timothy P. Krisher, Susan E. Borutski, Michael J. Connolly, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen*. **323**, L141, 164-E1 (1987)
- MOZURKEWICH, DAVID. Velocity Structure of Stellar Atmospheres: R Scuti. *David Mozurkewich, R. D. Gehrz, K. H. Hinkle, and D. L. Lambert*. **314**, 242, 30-F12 (1987)
- MUCHMORE, DAVID O. SiO Cooling Instability in the Envelopes of Cool Giant Stars. *David O. Muchmore, Joseph A. Nuth III, and Robert E. Stencel*. **315**, L141, 49-F10 (1987)
- MUFSON, S. L. see MAKINO, F., et al.
- MUKAI, KOJI. A New Soft X-Ray Mode in the AM Herculis Object E2003 + 225. *Julian P. Osborne, Klaus Beuermann, Philip Charles, Laura Maraschi, Koji Mukai, and Aldo Treves*. **315**, L123, 49-E5 (1987)
- MULLAN, D. J. Velocity Fields in a Low-Latitude Coronal Hole: Results from the Solar Maximum Mission. *D. J. Mullan and W. L. Waldron*. **317**, 487, 69-C5 (1987)
- Magnetohydrodynamic Modeling of Coronal Bright Points. *W. L. Waldron and D. J. Mullan*. **319**, 971, 105-E5 (1987)
- MÜLLER, DIETRICH. Cosmic-Ray Positrons from 10 to 20 GeV: A Balloon-borne Measurement Using the Geomagnetic East-West Asymmetry. *Dietrich Müller and Kwok-kwong Tang*. **312**, 183, 3-A4 (1987)
- MUNAKATA, HIROHARU. Neutrino-Pair Bremsstrahlung in Dense Stars. V. Partially Degenerate Electrons. *Hiroharu Munakata, Yasuharu Kohyama, and Naoki Itoh*. **316**, 708, 59-G3 (1987)
- MUNDT, R. Ultraviolet Spectra of HH 1 and HH 2: Spatial Variations and the Continuum Problem. *K. H. Böhm, Th. Bührke, A. C. Raga, E. W. Brugel, A. N. Witt, and R. Mundt*. **316**, 349, 53-G7 (1987)
- MUNDT, REINHARD. Jets from Young Stars: CCD Imaging, Long-Slit Spectroscopy, and Interpretation of Existing Data. *Reinhard Mundt, Edward W. Brugel, and Thomas Bührke*. **319**, 275, 96-A6 (1987)
- MUNDY, LEE G. Submillimeter Spectral Line Observations in Very Dense Regions. *Neal J. Evans II, Lee G. Mundy, John H. Davis, and Paul Vanden Bout*. **312**, 344, 4-E13 (1987)
- Models of Molecular Cloud Cores. III. A Multitransition Study of H₂CO. *Lee G. Mundy, Neal J. Evans II, Ronald L. Snell, and Paul F. Goldsmith*. **318**, 392, 83-B11 (1987)
- VLA Observations of H₂CO in Absorption against the Cosmic Background Radiation: Clumps in the S140 Molecular Cloud. *Neal J. Evans II, Marc L. Kutner, and Lee G. Mundy*. **323**, 145, 154-F3 (1987)
- MURAKAMI, AKINORI. Laboratory and Astronomical Detection of the Cyclic H₃H Radical. *Satoshi Yamamoto, Shuji Saito, Masatoshi Ohishi, Hiroko Suzuki, Shin-Ichi Ishikawa, Norio Kajifu, and Akinori Murakami*. **322**, L55, 145-D12 (1987)
- MURISON, M. A. Polarization of Light Scattered from the Winds of Early-Type Stars. *J. P. Cassinelli, K. H. Nordsieck, and M. A. Murison*. **317**, 290, 67-B1 (1987)
- MURPHY, D. C. A Composite CO Survey of the Entire Milky Way. *T. M. Dame, H. Ungerechts, R. S. Cohen, E. J. de Geus, I. A. Grenier, J. May, D. C. Murphy, L.-A. Nyman, and P. Thaddeus*. **322**, 706, 147-D13 (1987)
- MURPHY, G. A. Stokes Profile Analysis and Vector Magnetic Fields. III. Extended Temperature Minima of Sunspot Umbrae as Inferred from Stokes Profiles of Mg I λ 4571. *B. W. Lites, A. Skumanich, D. E. Rees, G. A. Murphy, and M. Carlsson*. **318**, 930, 91-B6 (1987)
- MURPHY, R. J. On the Origin of the Pion-Decay Radiation in the 1982 June 3 Solar Flare. *R. Ramaty, R. J. Murphy, and C. D. Dermer*. **316**, L41, 56-D3 (1987)
- High-Energy Processes in Solar Flares. *R. J. Murphy, C. D. Dermer, and R. Ramaty*. **63**, 721, 11-D13 (1987) (Abstr. in **313**, 931, 26-G14)
- MURRAY, STEPHEN D. Gas Clouds in Galactic Bulges. *William G. Mathews and Stephen D. Murray*. **312**, 66, 1-F12 (1987)
- MURTHY, J. IUE Observations of Hydrogen and Deuterium in the Local Interstellar Medium. *J. Murthy, R. C. Henry, H. W. Moos, W. B. Landsman, J. L. Linsky, A. Vidal-Madjar, and C. Gry*. **315**, 675, 48-A10 (1987)
- MUSHOTZKY, R. Are the Virial Masses of Clusters Smaller Than We Think? *L. L. Cowie, M. Henriksen, and R. Mushotzky*. **317**, 593, 72-E11 (1987)
- MUSIELAK, Z. E. On the Generation of Magnetohydrodynamic Waves in a Stratified and Magnetized Fluid. I. Vertical Propagation. *Z. E. Musielak and R. Rosner*. **315**, 371, 44-A5 (1987)
- MUSIELAK, ZDZISLAW E. Wave Energy in White Dwarf Atmospheres. I. Magnetohydrodynamic Energy Spectra for Homogeneous DB and Layered DA Stars. *Zdzislaw E. Musielak*. **322**, 234, 140-D8 (1987)
- MUSTAFA, ERROL. Gamma-Ray Pulsar Model. *Jeffrey M. Cohen and Errol Mustafa*. **319**, 930, 105-B5 (1987)
- MUTEL, ROBERT L. The Distribution of Maser Emission in OH/IR Stars. *Alan D. Welty, John D. Fix, and Robert L. Mutel*. **318**, 852, 90-C10 (1987)
- A Study of the Ground-State Hydroxyl Maser Emission Associated with 11 Regions of Star Formation. *Ralph A. Gaume and Robert L. Mutel*. **65**, 193, 31-A5 (1987) (Abstr. in **320**, 936, 120-B1)
- MUZZIO, JUAN C. Tidal Stripping and Accretion in Clusters of Galaxies with Smoothly Distributed Missing Mass. *Juan C. Muzzio, Victor H. Dessanuet, and Marcela Vergne*. **313**, 112, 16-C4 (1987)
- MYERS, P. C. Near-Infrared and Optical Observations of IRAS Sources in and near Dense Cores. *P. C. Myers, Gary A. Fuller, R. D. Mathieu, C. A. Beichman, P. J. Benson, R. E. Schild, and J. P. Emerson*. **319**, 340, 96-F5 (1987)
- MYERS, PHILIP C. The Circumstellar Envelope of W3(OH): NH₃ Observations. *Mark J. Reid, Philip C. Myers, and John H. Bieging*. **312**, 830, 12-A9 (1987)
- A Survey of IRAS Point Sources in Taurus for High-Velocity Molecular Gas. *Mark H. Heyer, Ronald L. Snell, Paul F. Goldsmith, and Philip C. Myers*. **321**, 370, 126-C3 (1987)
- MYERS, STEVEN T. The Molecular Cloud Ring in NGC 1068. *Steven T. Myers and N. Z. Scoville*. **312**, L39, 14-B6 (1987)
- MYRA, E. S. The Effects of Neutrino Transport on the Collapse of Iron Stellar Cores. *E. S. Myra, S. A. Bludman, Y. Hoffman, I. Lichenstadt, N. Sack, and K. A. Van Riper*. **318**, 744, 89-B2 (1987)
- NAGASE, F. Spectra and Pulse Period of the Binary X-Ray Pulsar 4U

- 1538 - 52. K. Makishima, K. Koyama, S. Hayakawa, and F. Nagase. **314**, 619, 36-C10 (1987)
- NAGATA, TETSUYA. Fluorescent Molecular Hydrogen Emission from the Reflection Nebula NGC 2023. *Ian Gatley, Tetsuo Hasegawa, Hiroko Suzuki, Ron Garden, Peter Brand, John Lightfoot, William Glencross, Haruyuki Okuda, and Tetsuya Nagata.* **318**, L73, 92-D4 (1987)
- NAKADA, Y. Water Maser Emission toward V788 Cygni, A Carbon Star. *Y. Nakada, H. Izumiura, T. Onaka, O. Hashimoto, N. Ukita, S. Deguchi, and T. Tanabé.* **323**, L77, 158-F6 (1987)
- NAKAGAWA, MASAYUKI. Axion Bremsstrahlung in Dense Stars. *Masayuki Nakagawa, Yasuharu Kohyama, and Naoki Itoh.* **322**, 291, 141-A9 (1987)
- Relativistic Free-free Gaunt Factor of the Dense High-Temperature Stellar Plasma. *Masayuki Nakagawa, Yasuharu Kohyama, and Naoki Itoh.* **63**, 661, 10-E14 (1987) (Abstr. in **313**, 930, 26-G13)
- NAKAJIMA, H. Current Loop Coalescence Model of Solar Flares. *T. Tajima, J. Sakai, H. Nakajima, T. Kosugi, F. Brunel, and M. R. Kundu.* **321**, 1031, 135-F11 (1987)
- NAKAZAKI, S. Effective Collision Strengths for Electron Impact Excitation in S II. *S. S. Tayal, J. W. Henry, and S. Nakazaki.* **313**, 487, 20-C10 (1987)
- NAMIKAWA, TOMIKAZU. The α -Effect Generated by Random Alfvén Waves in a Stratified Atmosphere and Particle Acceleration. *Tomikazu Namikawa, Hiromitsu Hamabata, and Hiroyuki Wada.* **323**, 414, 157-F3 (1987)
- NARASIMHA, D. The Gravitational Lens System 2016 + 112 Revisited. *D. Narasimha, K. Subramanian, and S. M. Chitre.* **315**, 434, 45-D11 (1987)
- NARAYAN, R. 1146 + 111B,C: A Giant Gravitational Lens? *R. D. Blandford, E. S. Phinney, and R. Narayan.* **313**, 28, 15-C6 (1987)
- NARAYAN, RAMESH. The Birthrate and Initial Spin Period of Single Radio Pulsars. *Ramesh Narayan.* **319**, 162, 94-G1 (1987)
- NARITA, SHINJI. The Equilibria of Rotating Isothermal Clouds. *Masayoshi Kiguchi, Shinji Narita, Shoken M. Miyama, and Chushiro Hayashi.* **317**, 830, 75-B5 (1987)
- NASH, A. G. The Origin of Rigidly Rotating Magnetic Field Patterns on the Sun. *N. R. Sheeley, Jr., A. G. Nash, and Y.-M. Wang.* **319**, 481, 98-D5 (1987)
- NASSIPOULOS, G. E. Periodic Photospheric and Chromospheric Modulation in Alpha Orionis (Betelgeuse). *A. K. Dupree, S. L. Baliunas, E. F. Guinan, L. Hartmann, G. E. Nassisopoulos, and G. Sonneborn.* **317**, L86, 78-D4 (1987)
- The Interstellar Medium toward Supernova 1987A. *A. K. Dupree, R. P. Kirshner, G. E. Nassisopoulos, J. C. Raymond, and G. Sonneborn.* **320**, 597, 116-B11 (1987)
- NASSIPOULOS, GEORGE E. Ultraviolet Observations of SN 1987A. *Robert P. Kirshner, George Sonneborn, D. Michael Crenshaw, and George E. Nassisopoulos.* **320**, 602, 116-C2 (1987)
- NATHER, R. E. The Exotic Helium Variable PG 1346 + 082. *M. A. Wood, D. E. Winget, R. E. Nather, Frederic V. Hessman, James Liebert, Donald W. Kurtz, F. Wesemael, and G. Wegner.* **313**, 757, 25-B1 (1987)
- An Independent Method for Determining the Age of the Universe. *D. E. Winget, C. J. Hansen, James Liebert, H. M. Van Horn, G. Fontaine, R. E. Nather, S. O. Kepler, and D. Q. Lamb.* **315**, L77, 49-B1 (1987)
- Two Extreme Examples of Compact Pulsators: PG 1115 + 158 and PG 1351 + 489. *D. E. Winget, R. E. Nather, and J. Allen Hill.* **316**, 305, 53-C11 (1987)
- NECKEL, TH. A New Cometary Nebula in Cygnus. *Th. Neckel and H. J. Staude.* **320**, L145, 121-F1 (1987)
- Temporal Changes of the IRS 5 Jet in L1551. *Th. Neckel and H. J. Staude.* **322**, L27, 145-B13 (1987)
- NEIL, M. SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806 - 20. *C. Kouveliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Neil, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov.* **322**, L21, 145-B8 (1987)
- NEILL, JAMES D. The Spatial Distribution and Population of Novae in M31. *Robin Ciardullo, Holland C. Ford, James D. Neill, George H. Jacoby, and Allen W. Shafter.* **318**, 520, 86-E6 (1987)
- NELAN, E. P. Ultraviolet and Visual Spectroscopy of DB White Dwarfs. *G. Wegner and E. P. Nelan.* **319**, 916, 105-A5 (1987)
- NELSON, L. A. The Evolutionary Status of 4U 1820 - 30. *S. Rappaport, L. A. Nelson, C. P. Ma, and P. C. Joss.* **322**, 842, 149-A12 (1987)
- NEMEC, JAMES M. Blue Straggler Stars in the Globular Cluster NGC 5466. *James M. Nemecek and Hugh C. Harris.* **316**, 172, 51-G7 (1987)
- NERNEY, STEVEN. Radiatively Driven Winds from Magnetic, Fast-rotating Stars: Wolf-Rayet Stars? *Steven Nerney and S. T. Suer.* **321**, 355, 126-B3 (1987)
- NETZER, NATHAN. Mass Loss from Evolved Stars. VII. OH Maser Shell Radii and Mass-Loss Rates for OH/IR Stars. *Nathan Netzer and G. R. Knapp.* **323**, 734, 162-F12 (1987)
- NEUFELD, DAVID A. H₂O Line Emission from Shocked Gas. *David A. Neufeld and Gary J. Melnick.* **322**, 266, 140-F12 (1987)
- NEUGEBAUER, G. The IRAS Bright Galaxy Sample. II. The Sample and Luminosity Function. *B. T. Soifer, D. B. Sanders, B. F. Madore, G. Neugebauer, G. E. Danielson, J. H. Elias, Carol J. Lonsdale, and W. L. Rice.* **320**, 238, 110-F7 (1987)
- Continuum Energy Distributions of Quasars in the Palomar-Green Survey. *G. Neugebauer, R. F. Green, K. Matthews, M. Schmidt, B. T. Soifer, and J. Bennett.* **63**, 615, 10-A7 (1987) (Abstr. in **313**, 929, 26-G12)
- NIEL, M. Gamma-Ray Burster Counterparts: Infrared. *Bradley E. Schaefer, T. L. Cline, U. Desai, B. J. Teegarden, J.-L. Atteia, C. Barai, K. Hurley, M. Niel, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, I. V. Estulin, and A. V. Kuznetsov.* **313**, 226, 17-D9 (1987)
- Short Solar Events with Evidence of Repetitive Structures. *Upendra D. Desai, Chryssa Kouveliotou, C. Barai, K. Hurley, M. Niel, R. Talon, G. Vedrenne, I. V. Estulin, and V. Ch. Dolidze.* **319**, 567, 99-E1 (1987)
- Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. *J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Kouveliotou, T. Cline, B. Dennis, U. Desai, and L. Orwig.* **320**, L105, 121-C7 (1987)
- A New Type of Repetitive Behavior in a High-Energy Transient. *J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Kouveliotou, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov.* **320**, L111, 121-C13 (1987)
- NIEBELA, VIRPI S. The Wolf-Rayet Population in 30 Doradus and Its Surroundings. *Anthony F. J. Moffat, Virpi S. Niemela, M. M. Phillips, You-hua Chu, and Wilhelm Seggewiss.* **312**, 612, 9-E7 (1987)
- NILSSON, A. E. Ultraviolet Doubly Excited Fe II Lines in the Laboratory and in the A-Type Star 21 Pegasi. *J. Adam, B. Baschek, S. Johansson, A. E. Nilsson, and T. Brage.* **312**, 337, 4-E6 (1987)
- NINKOV, Z. The Primary Orbit and Absorption Lines of HDE 226868 (Cygnus X-1). *Z. Ninkov, G. A. H. Walker, and S. Yang.* **321**, 425, 126-G4 (1987)
- The He II λ 4686 and H α Emission Lines of Cygnus X-1. *Z. Ninkov, G. A. H. Walker, and S. Yang.* **321**, 438, 127-A3 (1987)
- NISENSEN, P. Detection of a Very Bright Source Close to the LMC Supernova SN 1987A. *P. Nissenen, C. Papaliolios, M. Karovska, and R. Noyes.* **320**, L15, 114-B4 (1987)
- NISHIDA, M. see MAKINO, F., et al.
- NISHIDA, MINORU. Two Micron Spectroscopy of IRAS Galaxies. *Kimiaki Kawara, Minoru Nishida, and Brooke Gregory.* **321**, L35, 129-D12 (1987)
- NISHIDA, MITSUGU T. A Seyfert Nucleus of a New Ring Galaxy in Sextans. *Ken-ichi Wakamatsu and Mitsugu T. Nishida.* **315**, L23, 45-B12 (1987)
- NISINI, B. The Large-Scale Anisotropies of the Extragalactic Infrared Background. *R. Fabbri, P. Andreani, F. Melchiorri, and B. Nisini.* **315**, L2, 40-B4 (1987)
- NOCI, GIANCARLO. Solar Wind Diagnostics from Doppler-enhanced Scattering. *Giancarlo Noci, John L. Kohl, and George L. Withbroe.* **315**, 706, 48-D1 (1987)
- NOLTHENIUS, RICHARD. Dynamics of the Outer Disk and Halo of M31. *Richard Nolthenius and Holland C. Ford.* **317**, 62, 64-E13 (1987)
- NOMOTO, K. Collapsing White Dwarfs. *E. Baron, J. Cooperstein, S. Kahana, and K. Nomoto.* **320**, 304, 111-D5 (1987)
- NOMOTO, KEN'ICHI. Cooling of Neutron Stars: Effects of the Finite Time Scale of Thermal Conduction. *Ken'ichi Nomoto and Sachiko Tsuruta.* **312**, 711, 10-F4 (1987)
- Off-Center Ignition of Nuclear Burning in Merging White Dwarfs. *Yasushi Kawai, Hideyuki Saio, and Ken'ichi Nomoto.* **315**, 229, 42-D12 (1987)
- On Interacting Helium Star-White Dwarf Pairs as Supernova Precursors. *Icko Iben, Jr., Ken'ichi Nomoto, Amedeo Tormabè, and Alexander V. Tutukov.* **317**, 717, 73-G11 (1987)
- On the Collapse of 8-10 M_{\odot} Stars Due to Electron Capture. *Shigeki Miyaji and Ken'ichi Nomoto.* **318**, 307, 82-C2 (1987)
- Evolution of 8-10 M_{\odot} Stars toward Electron Capture Supernovae. II. Collapse of an O + Ne + Mg Core. *Ken'ichi Nomoto.* **322**, 206, 140-B8 (1987)
- NOONAN, THOMAS W. Remarks on the Necessity and Uniqueness of the Gravitational Stress-Energy Pseudotensor. *Thomas W. Noonan.* **313**, 37, 15-D1 (1987)
- NORDSIECK, K. H. Polarization of Light Scattered from the Winds of

- Early-Type Stars. *J. P. Cassinelli, K. H. Nordsieck, and M. A. Murison*. **317**, 290, 67-B1 (1987)
- NORDTVEIT, K., JR. A Possible Semisecular Variation in Orbital Period of Binary Pulsar System PSR 1913 + 16 and Lorentz Invariance of Gravity. *K. Nordtveit, Jr.* **322**, 288, 141-A6 (1987)
- NORDTVEIT, KEN. Probing Gravity to the Second Post-Newtonian Order and to One Part in 10^7 Using the Spin Axis of the Sun. *Ken Nordtveit*. **320**, 871, 119-C12 (1987)
- NORMAN, COLIN. On Pumping the Strong Water Maser Sources. *Nikolaos D. Kylafis and Colin Norman*. **323**, 346, 156-G1 (1987)
- NORMAN, COLIN A. The Formation and Evolution of Dwarf Galaxies and Lyman-Alpha Clouds: Two-Component Dark Matter. *Satoru Ikeuchi and Colin A. Norman*. **312**, 485, 8-C1 (1987)
- NORRIS, J. P. Discovery of 5 Hz Quasi-periodic Oscillations in Cygnus X-2. *J. P. Norris and K. S. Wood*. **312**, 732, 11-A1 (1987)
- SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806 - 20. *C. Kouveliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Neil, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhof*. **322**, L21, 145-B8 (1987)
- NORRIS, JOHN. The Ellipticities of Globular Clusters and the Cyanogen Problem. *John Norris*. **313**, L65, 27-C7 (1987)
- Population Studies: The Nature of the Thick Disk. *John Norris*. **314**, L39, 39-B4 (1987)
- NORRIS, R. P. Widespread Strong Methanol Masers near H II Regions. *R. P. Norris, J. L. Caswell, F. F. Gardner, and K. J. Wellington*. **321**, L159, 137-E8 (1987)
- NOUSEK, J. Observations of Soft X-Ray Spectra from a Seyfert 1 and a Narrow Emission-Line Galaxy: Erratum. *K. P. Singh, G. P. Garmire, and J. Nousek*. **312**, 484, 6-B10 (1987) (Orig. paper in **297**, 633, 108-D10)
- NOUSEK, J. A. A 9 Month Long Soft X-Ray Survey of the Large Magellanic Cloud. I. X-Ray Map at 1/4 keV. *K. P. Singh, J. A. Nousek, D. N. Burrows, and G. P. Garmire*. **313**, 185, 17-A7 (1987)
- NOYES, R. Detection of a Very Bright Source Close to the LMC Supernova SN 1987A. *P. Nissen, C. Papaliolios, M. Karowska, and R. Noyes*. **320**, L15, 114-B4 (1987)
- NOYMER, ANDREW J. The Perseus Flasher and Satellite Glints. *Bradley E. Schaefer, Michael Barber, John J. Brooks, Allen DeForrest, Paul D. Maley, Norman W. McLeod III, Russ McNeil, Andrew J. Noymer, A. K. Presnell, Richard Schwartz, and Scott Whitney*. **320**, 398, 112-D2 (1987)
- NULSEN, P. The Ionization Effects of Shock Breakout in SN 1987A. *M. A. Dopita, S. J. Meatheringham, P. Nulsen, and P. R. Wood*. **322**, L85, 152-C5 (1987)
- NÚÑEZ, L. Propagation of a Shock Wave in a Radiating Spherically Symmetric Distribution of Matter. *L. Herrera and L. Núñez*. **319**, 868, 104-D11 (1987)
- NUSSINOV, SHMUEL. Neutrino Annihilation in Type II Supernovae. *Jeremy Goodman, Arnon Dar, and Shmuel Nussinov*. **314**, L7, 33-B9 (1987)
- NUTH, JOSEPH A., III. SiO Cooling Instability in the Envelopes of Cool Giant Stars. *David O. Muchmore, Joseph A. Nuth III, and Robert E. Stencel*. **315**, L141, 49-F10 (1987)
- NYMAN, L.-Å. A Large Molecular Cloud in Lupus Far From the Galactic Plane. *L.-Å. Nyman, P. Thaddeus, L. Bronfman, and R. S. Cohen*. **314**, 374, 32-C4 (1987)
- A Composite CO Survey of the Entire Milky Way. *T. M. Dame, H. Ungerechts, R. S. Cohen, E. J. de Geus, I. A. Grenier, J. May, D. C. Murphy, L.-Å. Nyman, and P. Thaddeus*. **322**, 706, 147-D13 (1987)
- O'BRIEN, S. C. Long Carbon Chain Molecules in Circumstellar Shells. *H. W. Kroto, J. R. Heath, S. C. O'Brien, R. F. Curl, and R. E. Smalley*. **314**, 352, 32-A9 (1987)
- O'CONNELL, ROBERT W. Spectral Synthesis in the Ultraviolet. I. Far-Ultraviolet Stellar Library. *Michael N. Fanelli, Robert W. O'Connell, and Trinh X. Thuan*. **321**, 768, 133-A1 (1987)
- ODA, M. A Scanning Modulation Collimator Observation of the High Energy X-Ray Source in the Crab Nebula. *R. M. Pelling, W. S. Paciesas, L. E. Peterson, K. Makishima, M. Oda, Y. Ogawara, and S. Miyamoto*. **319**, 416, 97-F7 (1987)
- O'DEA, CHRISTOPHER P. Astrophysical Implications of the Multi-Frequency VLA Observations of NGC 1265. *Christopher P. O'Dea and Frazer N. Owen*. **316**, 95, 51-A11 (1987)
- Narrow-Angle Tail Radio Sources and the Distribution of Galaxy Orbits in Abell Clusters. *Christopher P. O'Dea, Craig L. Sarazin, and Frazer N. Owen*. **316**, 113, 51-C1 (1987)
- O'DELL, C. R. Fine-Scale Motion in the Central Orion Nebula. *Héctor O. Castañeda and C. R. O'Dell*. **315**, L55, 45-E9 (1987)
- Statistical Equilibrium in Cometary C_2 . IV. A 10 Level Model Including Singlet-Triplet Transitions. *K. S. Krishna Swamy and C. R. O'Dell*. **317**, 543, 69-G7 (1987)
- Fine-Scale Motion in NGC 6514 and NGC 6523. *C. R. O'Dell, L. K. Townsley, and Hector O. Castañeda*. **317**, 676, 73-D10 (1987)
- Evidence for Turbulence in H II Regions. *C. R. O'Dell and Hector O. Castañeda*. **317**, 686, 73-E6 (1987)
- Spectrophotometry of Comets Giacobini-Zinner and Halley. *Stephen C. Tegler and C. R. O'Dell*. **317**, 987, 77-A2 (1987)
- O'DELL, S. L. The Origin of the Photoionizing Continuum of Active Galactic Nuclei and Quasars. *S. L. O'Dell, H. A. Scott, and W. A. Stein*. **313**, 164, 16-F14 (1987)
- ODENWALD, STEN F. An IRAS Survey of IR Excesses in G-Type Stars. *Sten F. Odenwald*. **314**, 830, 38-F2 (1987) (Orig. paper in **307**, 711, 104-F6)
- Hydrodynamical Processes in the Draco Molecular Cloud. *Sten F. Odenwald and Lee J. Rickard*. **318**, 702, 88-E7 (1987)
- OEMLER, AUGUSTUS, JR. A Survey of the Bootes Void. *Robert P. Kirshner, Augustus Oemler, Jr., Paul L. Schechter, and Stephen A. Shectman*. **314**, 493, 35-A2 (1987)
- Profiles of Clusters of Galaxies: Cosmological Scenarios versus Observations. *Michael J. West, Avishai Dekel, and Augustus Oemler, Jr.* **316**, 1, 50-A8 (1987)
- OGAWA, H. S. Pioneer 10 Observations of the Beta Cephei Stars Gamma Pegasi and Delta Ceti. *Geraldine J. Peters, H. S. Ogawa, K. S. Judge, and D. L. Judge*. **314**, 261, 31-A3 (1987)
- OGAWARA, Y. A Scanning Modulation Collimator Observation of the High Energy X-Ray Source in the Crab Nebula. *R. M. Pelling, W. S. Paciesas, L. E. Peterson, K. Makishima, M. Oda, Y. Ogawara, and S. Miyamoto*. **319**, 416, 97-F7 (1987)
- OHISHI, MASATOSHI. Detection of Intense Unidentified Lines in TMC-1. *Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito*. **317**, L111, 78-E14 (1987)
- Laboratory Detection and Astronomical Identification of a New Free Radical, $CCS^+(3\Sigma^-)$. *Shuji Saito, Kentarou Kawaguchi, Satoshi Yamamoto, Masatoshi Ohishi, Hiroko Suzuki, and Norio Kaifu*. **317**, L115, 78-F3 (1987)
- Laboratory Detection of a New Carbon-Chain Molecule C_3S and Its Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, Kentarou Kawaguchi, Norio Kaifu, Hiroko Suzuki, and Masatoshi Ohishi*. **317**, L119, 78-F7 (1987)
- Level Population and Para/Ortho Ratio of Fluorescent H_2 in NGC 2023. *Tetsuo Hasegawa, Ian Gatley, Ron P. Garden, Peter W. J. L. Brand, Masatoshi Ohishi, Masahiko Hayashi, and Norio Kaifu*. **318**, L77, 92-D12 (1987)
- Laboratory and Astronomical Detection of the Cyclic H_3H Radical. *Satoshi Yamamoto, Shuji Saito, Masatoshi Ohishi, Hiroko Suzuki, Shin-ichi Ishikawa, Norio Kaifu, and Akinori Murakami*. **322**, L55, 145-D12 (1987)
- Laboratory Microwave Spectroscopy of the Vibrational Satellites for the ν_7 and $2\nu_7$ States of C_2H and Their Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, M. Guélin, J. Cernicharo, Hiroko Suzuki, and Masatoshi Ohishi*. **323**, L149, 164-E8 (1987)
- OHSAWA, YUKIHARU. Nonstochastic Prompt Proton Acceleration by Fast Magnetosonic Shocks in the Solar Plasma. *Yukiharu Ohsawa and Jun-ichi Sakai*. **313**, 440, 19-G4 (1987)
- OKE, J. B. Narrow-Line Seyfert Galaxies with Permitted Fe II Emission: Markarian 507, 5C 3.100, and I Zwicky 1. *J. P. Halpern and J. B. Oke*. **312**, 91, 2-A9 (1987)
- The Triple Radio Source 0023 + 171: A Candidate for a Dark Gravitational Lens. *J. N. Hewitt, E. L. Turner, C. R. Lawrence, D. P. Schneider, J. E. Gunn, C. L. Bennett, B. F. Burke, J. H. Mahoney, G. I. Langston, M. Schmidt, J. B. Oke, and J. G. Hoessel*. **321**, 706, 132-C5 (1987)
- OKUDA, HARUYUKI. Fluorescent Molecular Hydrogen Emission from the Reflection Nebula NGC 2023. *Ian Gatley, Tetsuo Hasegawa, Hiroko Suzuki, Ron Garden, Peter Brand, John Lightfoot, William Glencross, Haruyuki Okuda, and Tetsuya Nagata*. **318**, L73, 92-D4 (1987)
- OKUMURA, S. High-Resolution Observations of CO from the Bipolar Nebula CRL 2688. *R. Kawabe, M. Ishiguro, T. Kasuga, K.-I. Morita, N. Ukita, H. Kobayashi, S. Okumura, E. Fomalont, and N. Kaifu*. **314**, 322, 31-F1 (1987)
- OLALDE, J. C. Comet Halley: OH Absorption of Galactic Background Radio Sources. *E. Bajaja, E. M. Arnal, J. C. Cerosimo, F. R. Colomb, M. C. Martin, J. Mazzaro, R. Morras, J. C. Olalde, W. G. L. Pöppel, A. M. Silva, I. F. Mirabel, and V. Boriakoff*. **313**, 906, 26-F2 (1987)
- Observation of the OH 1667 MHz Line toward Comet Halley from the Southern Hemisphere. *E. Bajaja, R. Morras, W. G. L. Pöppel, J. E. Cerosimo, M. C. Martin, J. Mazzaro, J. C. Olalde, A. Silva, E. M. Arnal, F. R. Colomb, I. F. Mirabel, and V. Boriakoff*. **322**, 549,

- 144-A1 (1987)
- OLDERSHAW, ROBERT L. The Self-similar Cosmological Paradigm: A New Test and Two New Predictions. *Robert L. Oldershaw*. **322**, 34, 138-C12 (1987)
- OLIVA, E. Forbidden Lines of Si I: An Alternate Interpretation for an Infrared Emission Feature in the Spectrum of SN 1983N (M83). *E. Oliva*. **321**, L45, 129-E12 (1987)
- OLIVE, KEITH A. Chemical Evolution, Stellar Nucleosynthesis, and a Variable Star Formation Rate. *Keith A. Olive, Friedrich-Karl Thielemann, and James W. Truran*. **313**, 813, 25-F1 (1987)
- OLIVERSEN, R. J. The Large-Scale Radio Structure of R Aquarii. *J. M. Hollis, M. Kafatos, A. G. Michalitsianos, R. J. Olsen, and F. Yusef-Zadeh*. **321**, L55, 129-F6 (1987)
- OMODAKA, T. The Bright-Rimmed Molecular Cloud around S140 IRS. II. Bipolar Outflow from S140 IRS 1. *M. Hayashi, T. Hasegawa, T. Omodaka, S. S. Hayashi, and R. Miyawaki*. **312**, 327, 4-D10 (1987)
- OMONT, A. Photochemistry and Molecular Ions in Oxygen-rich Circumstellar Envelopes. *G. A. Mamon, A. E. Glassgold, and A. Omont*. **323**, 306, 156-D3 (1987)
- OMONT, ALAIN. The Rich Molecular Spectrum and the Rapid Outflow of OH 231.8 + 4.2. *Mark Morris, Stéphane Guilloteau, Robert Lucas, and Alain Omont*. **321**, 888, 134-C8 (1987)
- ONAKA, T. Water Maser Emission toward V788 Cygni, A Carbon Star. *Y. Nakada, H. Izumiura, T. Onaka, O. Hashimoto, N. Ukita, S. Deguchi, and T. Tanabé*. **323**, L77, 158-F6 (1987)
- ONAKA, TAKASHI. Infrared Spectrum of Quenched Carbonaceous Composite (QCC). II. A New Identification of the 7.7 and 8.6 Micron Unidentified Infrared Emission Bands. *Akira Sakata, Setsuko Wada, Takashi Onaka, and Alan T. Tokunaga*. **320**, L63, 114-E9 (1987)
- ONDA, K. Para/Ortho Abundance Ratio of Molecular Hydrogen in NGC 2023. *K. Takayanagi, K. Sakimoto, and K. Onda*. **318**, L81, 92-E2 (1987)
- ORIO, MARINA. The Nature of the Recurrent Novae. *Ronald F. Webbink, Mario Livia, James W. Truran, and Marina Orio*. **314**, 653, 36-F9 (1987)
- ORLATI, MARIA ANTONIETTA. On the Source of the Violet Depression in Carbon Stars: A Study of the Balmer Decrement in Carbon Long-Period Variables. *Maria Antonietta Orlati*. **317**, 819, 75-A6 (1987)
- OROFINO, V. Interstellar Amorphous Carbon. *E. Bussolotti, L. Colangeli, and V. Orofino*. **321**, L87, 130-A7 (1987)
- ORWIG, L. Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. *J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Kouveliotou, T. Cline, B. Dennis, U. Desai, and L. Orwig*. **320**, L105, 121-C7 (1987)
- ORWIG, L. E. A New Type of Repetitive Behavior in a High-Energy Transient. *J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Kouveliotou, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. **320**, L111, 121-C13 (1987)
- The High-Energy X-Ray Spectrum of Black Hole Candidate GX 339 - 4 during a Transition. *J. F. Dolan, C. J. Crannell, B. R. Dennis, and L. E. Orwig*. **322**, 324, 141-D1 (1987)
- SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806 - 20. *C. Kouveliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. **322**, L21, 145-B8 (1987)
- OSBORNE, JULIAN P. A New Soft X-Ray Mode in the AM Herculis Object E2003 + 225. *Julian P. Osborne, Klaus Beuermann, Philip Charles, Laura Maraschi, Koji Mukai, and Aldo Treves*. **315**, L123, 49-E5 (1987)
- OSHEROVICH, VLADIMIR A. Formation of a Solar Coronal Transient with Forerunner. *Erast B. Gliner and Vladimir A. Osherovich*. **312**, 412, 5-C12 (1987)
- OSTERBROCK, DONALD E. The Ultraviolet and Optical Emission-Line Spectrum of III Zw 77. *Gary J. Ferland and Donald E. Osterbrock*. **318**, 145, 80-E3 (1987)
- Optical Spectra of Narrow Emission Line Palomar-Green Galaxies. *Donald E. Osterbrock and Richard W. Pogge*. **323**, 108, 154-C4 (1987)
- Spectral Classification of Emission-Line Galaxies. *Sylvain Veilleux and Donald E. Osterbrock*. **63**, 295, 4-G1 (1987) (Abstr. in **312**, 965, 13-E6)
- OSTRIKER, J. P. Distortion of the Cosmic Background Radiation by Superconducting Strings. *J. P. Ostriker and C. Thompson*. **323**, L97, 164-A9 (1987)
- OSTRIKER, JEREMIAH P. Evolution of N-Body Systems with Tidally Captured Binaries through the Core Collapse Phase. *Thomas S. Statler, Jeremiah P. Ostriker, and Haldan N. Cohn*. **316**, 626, 58-G9 (1987)
- The Evolution and Final Disintegration of Spherical Stellar Systems in a Steady Galactic Tidal Field. *Hyoung Mok Lee and Jeremiah P. Ostriker*. **322**, 123, 139-C6 (1987)
- OTTUSCH, J. J. New Lines of Ethylene and a Search for Methylene in IRC +10216. *D. M. Goldhaber, A. L. Betz, and J. J. Ottusch*. **314**, 356, 32-A13 (1987)
- OWEN, FRAZER N. Astrophysical Implications of the Multifrequency VLA Observations of NGC 1265. *Christopher P. O'Dea and Frazer N. Owen*. **316**, 95, 51-A11 (1987)
- Narrow-Angle Tail Radio Sources and the Distribution of Galaxy Orbits in Abell Clusters. *Christopher P. O'Dea, Craig L. Sarazin, and Frazer N. Owen*. **316**, 113, 51-C1 (1987)
- OWENS, A. Gamma-Ray Observations of the Crab Region Using a Coded-Aperture Telescope. *M. L. McConnell, P. P. Dunphy, D. J. Forrest, E. L. Chupp, and A. Owens*. **321**, 543, 128-A13 (1987)
- OZNOVICH, I. An IUE Survey of Activity in Red Giants and Supergiants. *I. Oznovich and D. M. Gibson*. **319**, 383, 97-C10 (1987)
- PACIESAS, W. S. A Scanning Modulation Collimator Observation of the High Energy X-Ray Source in the Crab Nebula. *R. M. Pelling, W. S. Paciesas, L. E. Peterson, K. Makishima, M. Oda, Y. Ogawara, and S. Miyamoto*. **319**, 416, 97-F7 (1987)
- PACINI, F. Optical and X-Ray Radiation from Fast Pulsars: Effects of Duty Cycle and Spectral Shape. *F. Pacini and M. Salvati*. **321**, 447, 127-A12 (1987)
- PACZYŃSKI, BOHDAN. Gamma-Ray Bursts from Superconducting Cosmic Strings at Large Redshifts. *Arif Babul, Bohdan Paczyński, and David Spergel*. **316**, L49, 62-A9 (1987)
- Gravitational Lensing by an Ensemble of Isothermal Galaxies. *Neal Katz and Bohdan Paczyński*. **317**, 11, 64-B3 (1987)
- Gravitational Microlensing and Gamma-Ray Bursts. *Bohdan Paczyński*. **317**, L51, 78-B1 (1987)
- Model Atmospheres of Near-Eddington Limit X-Ray Bursters. *Arif Babul and Bohdan Paczyński*. **323**, 582, 161-B5 (1987)
- PADMANABHAN, T. Dynamical Scenarios with Unstable Neutrinos. *T. Padmanabhan and M. M. Vasanthi*. **315**, 411, 45-C1 (1987)
- PADRIELLI, LUCIA. 18 Centimeter VLBI Observations of the Quasar NRAO 140 during and after a Low-Frequency Outburst. *Alan P. Marscher, John J. Broderick, Lucia Padrielli, Norbert Bartel, and Jonathan D. Romney*. **319**, 456, 98-B8 (1987)
- PAERELS, F. B. S. Determination of Photospheric Helium Abundances for the Hot White Dwarfs LB 1663 and CD - 38°10980 from EXOSAT Soft X-Ray Photometry. *F. B. S. Paerels, J. Heise, S. M. Kahn, and R. D. Rogers*. **322**, 315, 141-C6 (1987)
- PAKULL, MANFRED W. The Optical Light Curve of the Low-Mass X-Ray Binary XB 1254 - 690. *Christian Motch, Holger Pedersen, Klaus Beuermann, Manfred W. Pakull, and Thierry J.-L. Courvoisier*. **313**, 792, 25-D8 (1987)
- PAKVASA, SANDIP. The Initial Neutrino Events from Supernovae as Evidence for Matter versus Antimatter. *Alan V. Barnes, Thomas J. Weiler, and Sandip Pakvasa*. **323**, L31, 158-C4 (1987)
- PALLA, FRANCESCO. The Effects of Stimulated Star Formation on the Evolution of the Galaxy. III. The Chemical Evolution of Nonlinear Systems. *Steven N. Shore, Federico Ferrini, and Francesco Palla*. **316**, 663, 59-C14 (1987)
- PALLAVICINI, R. Hydrodynamic Flare Modeling: Comparison of Numerical Calculations with SMM Observations of the 1980 November 12 17:00 UT Flare. *G. Peres, F. Reale, S. Serio, and R. Pallavicini*. **312**, 895, 12-F5 (1987)
- PALLAVICINI, ROBERTO. Analysis of Ultraviolet and X-Ray Observations of Three Homologous Solar Flares from SMM. *Chung-Chieh Cheng and Roberto Pallavicini*. **318**, 459, 84-A3 (1987)
- PALMA, AMEDEO. Collisional Excitation of an Asymmetric Rotor, Silicon Dicarbid. *Amedeo Palma and Sheldon Green*. **316**, 830, 61-B9 (1987)
- Collisional Excitation of Interstellar Sulfur Dioxide. *Amedeo Palma*. **64**, 565, 25-A7 (1987) (Abstr. in **317**, 1003, 77-B6)
- PALMER, PATRICK. The Dispersal of Dense Protostellar Material: NH₃ Hot Cores and Outflows in Sagittarius B2. *S. N. Vogel, R. Genzel, and Patrick Palmer*. **316**, 243, 52-F3 (1987)
- PALUMBO, G. G. C. The Most Luminous Far-Infrared Extragalactic Sources. *M. Harwit, J. R. Houck, B. T. Soifer, and G. G. C. Palumbo*. **315**, 28, 40-C6 (1987)
- PAPALIOLOS, C. Detection of a Very Bright Source Close to the LMC Supernova SN 1987A. *P. Nissen, C. Papaliolos, M. Karouska, and R. Noyes*. **320**, L15, 114-B4 (1987)
- PARESCE, FRANCESCO. Broad-Band Imaging of the Beta Pictoris Circumstellar Disk. *Francesco Paresce and Christopher Burrows*. **319**, L23, 100-C1 (1987)
- PARK, H. S. see SVOBODA, R. et al.

- PARKER, E. N. The Dynamical Oscillation and Propulsion of Magnetic Fields in the Convective Zone of a Star. I. General Considerations. *E. N. Parker*. **312**, 868, 12-D6 (1987)
- Magnetic Reorientation and the Spontaneous Formation of Tangential Discontinuities in Deformed Magnetic Fields. *E. N. Parker*. **318**, 876, 90-E6 (1987)
- Magnetic Monopole Plasma Oscillations and the Survival of Galactic Magnetic Fields. *E. N. Parker*. **321**, 349, 126-A11 (1987)
- The Dynamical Oscillation and Propulsion of Magnetic Fields in the Convective Zone of a Star. II. Thermal Shadows. *E. N. Parker*. **321**, 984, 135-C6 (1987)
- The Dynamical Oscillation and Propulsion of Magnetic Fields in the Convective Zone of a Star. III. Accumulation of Heat and the Onset of the Rayleigh-Taylor Instability. *E. N. Parker*. **321**, 1009, 135-E3 (1987)
- PARMAR, A. N. Intensity and Source State Dependence of the Quasi-periodic Oscillations in Scorpius X-1. *M. van der Klis, L. Stella, N. White, F. Jansen, and A. N. Parmar*. **316**, 411, 54-F3 (1987)
- The Discovery of 7 and 24–28 Hertz Quasi-periodic Oscillations in the X-Ray Flux of GX 17 + 2 (4U 1812 – 14). *L. Stella, A. N. Parmar, and N. E. White*. **321**, 418, 126-F11 (1987)
- The Properties of Bursts with Short Recurrence Times from the Transient X-Ray Source EXO 0748 – 676. *M. Gotwald, F. Haberl, A. N. Parmar, and N. E. White*. **323**, 575, 161-A11 (1987)
- PARMAR, P. S. Far-Infrared Continuum Emission from the Nucleus, Starburst, and Extended Spiral Arms of NGC 1068. *D. F. Lester, M. Joy, P. M. Harvey, H. B. Ellis, Jr., and P. S. Parmar*. **321**, 755, 132-G1 (1987)
- PARMEGGIANI, G. Deconvolution of Elliptical Nuclei of Galaxies: Application to M81: Erratum. *O. Bendielli, G. Parmeggiani, and T. Zavatti*. **315**, 408, 44-C14 (1987) (Orig. paper in **308**, 611, 115-E14)
- PARTIDGE, R. B. Preliminary VLA Limits on the Sunyaev-Zel'dovich Effect in Abell 2218. *R. B. Partidge, R. A. Perley, N. Mandolesi, and F. Delpino*. **317**, 112, 65-B11 (1987)
- PARTRIDGE, R. BRUCE. 6 Centimeter Radio Source Counts and Spectral Index Studies Down to 0.1 Millijansky. *R. Hank Donnelly, R. Bruce Partridge, and Rogier A. Windhorst*. **321**, 94, 123-B9 (1987)
- PASTORIZA, M. G. Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. *V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storch-Bergmann, and J. Matthews*. **320**, 589, 116-B3 (1987)
- PATTERSON, J. A. Hard X-Ray Source in the Nearest Molecular Cloud. *J. P. Halpern and J. Patterson*. **312**, L31, 7-C2 (1987)
- Einstein Observations of EF Eridani (2A 0311 – 227), the Textbook Example of AM Herculis-type Systems. *K. Beuermann, L. Stella, and J. Patterson*. **316**, 360, 54-A6 (1987)
- PATTERSON, JOSEPH. Magnetic Activity, Tides, and Orbital Period Changes in Close Binaries. *James H. Applegate and Joseph Patterson*. **322**, L99, 152-D4 (1987)
- PAUL, J. A. A Deep Optical Study of the Field of 1E 0630 + 178. *G. F. Bignami, P. A. Caraveo, J. A. Paul, L. Salotti, and L. Vigroux*. **319**, 358, 97-A1 (1987)
- PEDERSEN, HOLGER. The Optical Light Curve of the Low-Mass X-Ray Binary XB 1254 – 690. *Christian Motch, Holger Pedersen, Klaus Beuermann, Manfred W. Pakull, and Thierry J.-L. Courvoisier*. **313**, 792, 25-D8 (1987)
- PEEBLES, P. J. E. Cosmic Background Temperature Anisotropy in a Minimal Isocurvature Model for Galaxy Formation. *P. J. E. Peebles*. **315**, L73, 49-A11 (1987)
- A Fluid Model for the Evolution of Large-Scale Structure. *P. J. E. Peebles*. **317**, 576, 72-D8 (1987)
- The Local Extragalactic Velocity Field, the Local Mean Mass Density, and Biased Galaxy Formation. *M. E. Brown and P. J. E. Peebles*. **317**, 588, 72-E6 (1987)
- PELAT, D. A Detailed Study of the C IV λ 1550 Line Profile and Adjacent Spectral Features in NGC 4151 from 1978 to 1983. *J. Clavel, A. Altamore, A. Boksenberg, G. E. Bromage, A. Elvius, D. Pelat, M. V. Penston, G. C. Perola, M. A. J. Snijders, and M. H. Ulrich*. **321**, 251, 125-A5 (1987)
- PELLAT, R. On the Antonov Criterion for Gravothermal Instability. *J. F. Luciani and R. Pellat*. **317**, 241, 66-E8 (1987)
- Nonlinear Coupling of Galactic Spiral Modes. *M. Tagger, J. F. Sygnet, E. Athanassoula, and R. Pellat*. **318**, L43, 92-B4 (1987)
- PELLING, R. M. A Scanning Modulation Collimator Observation of the High Energy X-Ray Source in the Crab Nebula. *R. M. Pelling, W. S. Paciesas, L. E. Peterson, K. Makishima, M. Oda, Y. Ogawara, and S. Miyamoto*. **319**, 416, 97-F7 (1987)
- PENNINX, W. EXOSAT Observations of 4U/MXB 1636 – 53: On the Relation between the Amount of Accreted Fuel and the Strength of an X-Ray Burst. *W. H. G. Lewin, W. Penninx, J. van Paradijs, E. Damen, M. Sztajno, J. Trümper, and M. van der Klis*. **319**, 893, 104-F9 (1987)
- Multipeaked X-Ray Bursts from 4U/MXB 1636 – 53: Evidence against Burst-induced Accretion Disk Coronae. *W. Penninx, J. van Paradijs, and W. H. G. Lewin*. **321**, L67, 129-G4 (1987)
- PENNYPACKER, C. R. Optical Color, Polarimetric, and Timing Measurements of the 50 Millisecond Large Magellanic Cloud Pulsar, PSR 0540 – 69. *J. Middlethick, C. R. Pennyacker, and M. S. Burns*. **315**, 142, 41-E8 (1987)
- PENROD, G. DONALD. Doppler Images of Rotating Stars Using Maximum Entropy Image Reconstruction. *Steven S. Vogt, G. Donald Penrod, and Artie P. Hatzes*. **321**, 496, 127-E5 (1987)
- PENSTON, M. V. A Detailed Study of the C IV λ 1550 Line Profile and Adjacent Spectral Features in NGC 4151 from 1978 to 1983. *J. Clavel, A. Altamore, A. Boksenberg, G. E. Bromage, A. Elvius, D. Pelat, M. V. Penston, G. C. Perola, M. A. J. Snijders, and M. H. Ulrich*. **321**, 251, 125-A5 (1987)
- PERAIAH, A. Aberration and Advection Effects in a Plane-parallel Medium in Motion. *A. Peraiah*. **317**, 271, 66-G10 (1987)
- PERCY, JOHN R. The Nonradial Oscillations of ϵ Persei. II. Nonlinear Characteristics. *Myron A. Smith, Alexander W. Fullerton, and John R. Percy*. **320**, 768, 118-B10 (1987)
- PERES, G. Hydrodynamic Flare Modeling: Comparison of Numerical Calculations with SMM Observations of the 1980 November 12 17:00 UT Flare. *G. Peres, F. Reale, S. Serio, and R. Pallavicini*. **312**, 895, 12-F5 (1987)
- Simulations of the Ca XIX Spectral Emission from a Flaring Solar Coronal Loop. I. Thermal Case. *E. Antonucci, M. A. Doderio, G. Peres, S. Serio, and R. Rosner*. **322**, 522, 143-F1 (1987)
- PERINOTTO, M. The "SEI" Method for Accurate and Efficient Calculations of Line Profiles in Spherically Symmetric Stellar Winds. *H. G. L. M. Lamers, M. Cerruti-Sola, and M. Perinotto*. **314**, 726, 37-E6 (1987)
- PERLEY, R. Discovery of a Probable Binary Quasar. *S. Djorgovski, R. Perley, G. Meylan, and P. McCarthy*. **321**, L17, 129-C6 (1987)
- PERLEY, R. A. The Faraday Rotation of Cygnus A: Magnetic Fields in Cluster Gas. *J. W. Dreher, C. L. Carilli, and R. A. Perley*. **316**, 611, 58-F7 (1987)
- Preliminary VLA Limits on the Sunyaev-Zel'dovich Effect in Abell 2218. *R. B. Partidge, R. A. Perley, N. Mandolesi, and F. Delpino*. **317**, 112, 65-B11 (1987)
- PEROLA, G. C. A Detailed Study of the C IV λ 1550 Line Profile and Adjacent Spectral Features in NGC 4151 from 1978 to 1983. *J. Clavel, A. Altamore, A. Boksenberg, G. E. Bromage, A. Elvius, D. Pelat, M. V. Penston, G. C. Perola, M. A. J. Snijders, and M. H. Ulrich*. **321**, 251, 125-A5 (1987)
- PERRIER, C. On the Binary Nature of Van Biesbroeck 8. *C. Perrier and J.-M. Mariotti*. **312**, L27, 7-B12 (1987)
- PERSSON, CAROL J. LONSDALE. On the Origin of the 40–120 Micron Emission of Galaxy Disks: A Comparison with Ha Fluxes. *Carol J. Lonsdale Persson and George Helou*. **314**, 513, 35-B8 (1987)
- PERSSON, S. E. Emission from CO Band Heads in Young Stellar Objects. *T. R. Geballe and S. E. Persson*. **312**, 297, 4-B8 (1987)
- PESCH, PETER. The Case Low-Dispersion Northern Sky Survey. IV. Galaxies in the Bootes Void Region. *N. Sanduleak and Peter Pesch*. **63**, 809, 13-F6 (1987) (Abstr. in **314**, 831, 38-F7)
- PESNELL, W. DEAN. A New Driving Mechanism for Stellar Pulsations. *W. Dean Pesnell*. **314**, 598, 36-B3 (1987)
- Pulsations of White Dwarf Stars with Thick Hydrogen or Helium Surface Layers. *Arthur N. Cox, Sumner G. Starrfield, Russell B. Kidman, and W. Dean Pesnell*. **317**, 303, 67-B14 (1987)
- PETERS, GERALDINE J. Pioneer 10 Observations of the Beta Cephei Stars Gamma Pegasi and Delta Ceti. *Geraldine J. Peters, H. S. Ogawa, K. S. Judge, and D. L. Judge*. **314**, 261, 31-A3 (1987)
- PETERS, W. L. The Correlation of Spiral Arm Molecular Clouds with Cold Atomic Hydrogen. *W. L. Peters and F. N. Bash*. **317**, 646, 73-B8 (1987)
- PETERSON, BRADLEY M. Variability of the Optical Spectrum of NGC 5548 and Evidence for a Multiple-Component Broad-Line Region. *Bradley M. Peterson*. **312**, 79, 1-G11 (1987)
- The Double Broad-Line Emitting Regions in NGC 5548 as Possible Evidence for a Supermassive Binary. *Bradley M. Peterson, Kirk T. Korista, and Stephen A. Cota*. **312**, L1, 7-A4 (1987)
- The Accuracy of Cross-Correlation Estimates of Quasar Emission-Line Region Sizes. *C. Martin Gaskell and Bradley M. Peterson*. **65**, 1, 28-A5 (1987) (Abstr. in **319**, 1011, 106-A9)
- PETERSON, D. M. Milliarsecond Resolution Infrared Observations of Young Stars in Taurus and Ophiuchus. *M. Simon, R. R. Howell, A. J. Longmore, B. A. Wilking, D. M. Peterson, and W.-P. Chen*. **320**, 344, 111-G3 (1987)
- PETERSON, DEANE M. Finsen 342 and the Hyades Distance Modulus.

- Deane M. Peterson and Richard Solensky. **315**, 286, 43-A13 (1987)
- PETERSON, L. E. A Scanning Modulation Collimator Observation of the High Energy X-Ray Source in the Crab Nebula. R. M. Pelling, W. S. Paciesas, L. E. Peterson, K. Makishima, M. Oda, Y. Ogawara, and S. Miyamoto. **319**, 416, 97-F7 (1987)
- PETRE, ROBERT. Forbidden Coronal Iron Line Images of Puppis A: Cloud Evaporation or Shocked Cloud? Richard G. Teske and Robert Petre. **314**, 673, 37-A2 (1987)
- Forbidden Coronal Iron-Line Emission in the Puppis A Shock Front: The Effect of Inhomogeneities. Richard G. Teske and Robert Petre. **318**, 370, 83-A1 (1987)
- IRAS Observations of Supernova Remnants: A Comparison between Their Infrared and X-Ray Cooling Rates. Eli Dwek, Robert Petre, Andrew Szymkowiak, and Walter L. Rice. **320**, 27, 114-C4 (1987)
- PETROSIAN, V. Analytic and Numerical Calculations of Quantum Synchrotron Spectra from Relativistic Electron Distributions. J. J. Brainerd and V. Petrosian. **320**, 703, 117-D11 (1987)
- PETROSIAN, VAHÉ. Generation of Plasma Waves by Thick-Target Electron Beams and the Expected Radiation Signature. Russell J. Hamilton and Vahé Petrosian. **321**, 721, 132-D6 (1987)
- PHILLIPS, A. IRAS 18059 - 3211: Optically Known As Gomez's Hamburger: Erratum. M. T. Ruiz, V. Blanco, J. Maza, S. Heathcote, A. Phillips, K. Kawara, C. Anguita, M. Hamuy, and A. Gomez. **320**, L157, 121-F14 (1987) (Orig. paper in **316**, L21, 56-B10)
- PHILLIPS, ANDREW. IRAS 1809 - 3211: Optically Known as "Gomez's Hamburger". Maria Teresa Ruiz, Victor Blanco, José Maza, Steve Heathcote, Andrew Phillips, Kimiaki Kawara, Claudio Anguita, Mario Hamuy, and Arturo Gómez. **316**, L21, 56-B10 (1987)
- PHILLIPS, JOHN G. The Near-Infrared Spectrum of the FeH Molecule. John G. Phillips, Sumner P. Davis, Bo Lindgren, and Walter J. Balfour. **65**, 721, 39-F2 (1987) (Abstr. in **322**, 1077, 151-G3)
- PHILLIPS, M. M. The Wolf-Rayet Population in 30 Doradus and Its Surroundings. Anthony F. J. Moffat, Virpi S. Niemela, M. M. Phillips, You-hua Chu, and Wilhelm Seggewiss. **312**, 612, 9-E7 (1987)
- Infrared Photometry and Spectroscopy of Supernova 1986g in NGC 5128-Centaurus. A. Jay A. Frogel, Brooke Gregory, Kimiaki Kawara, Dave Laney, M. M. Phillips, Don Terndrup, Frederick Vrba, and Albert E. Whitford. **315**, L129, 49-E11 (1987)
- Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storchi-Bergmann, and J. Matthews. **320**, 589, 116-B3 (1987)
- PHILLIPS, P. E. A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengston, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan. **313**, 920, 26-G3 (1987)
- PHILLIPS, T. G. Molecular Gas in the Starburst Nucleus of M82. K. Y. Lo, K. W. Cheung, C. R. Masson, T. G. Phillips, S. L. Scott, and D. P. Woody. **312**, 574, 9-B7 (1987)
- Comparison of Submillimeter and Ultraviolet Observations of Neutral Carbon toward Zeta Ophiuchi. Jocelyn Keene, Geoffrey A. Blake, and T. G. Phillips. **313**, 396, 19-D1 (1987)
- Molecular Abundances in OMC-1: The Chemical Composition of Interstellar Molecular Clouds and the Influence of Massive Star Formation. Geoffrey A. Blake, E. C. Sutton, C. R. Masson, and T. G. Phillips. **315**, 621, 47-D9 (1987)
- Molecular Spiral Structure in M51. K. Y. Lo, R. Ball, C. R. Masson, T. G. Phillips, S. Scott, and D. P. Woody. **317**, L63, 78-B11 (1987)
- CO Maps of the OMC-1 Outflow. C. R. Masson, K. Y. Lo, T. G. Phillips, A. I. Sargent, N. Z. Scoville, and D. P. Woody. **319**, 446, 98-A11 (1987)
- CO Emission from Centaurus A. T. G. Phillips, B. N. Ellison, J. B. Keene, R. B. Leighton, R. J. Howard, C. R. Masson, D. B. Sanders, B. Veidt, and K. Young. **322**, L73, 152-B8 (1987)
- PHINNEY, E. S. 1146 + 111B.C: A Giant Gravitational Lens? R. D. Blandford, E. S. Phinney, and R. Narayan. **313**, 28, 15-C6 (1987)
- PICONE, J. M. Nonlinear Evolution of Radiation-driven Thermally Unstable Fluids. R. B. Dahlburg, C. R. DeVore, J. M. Picone, J. T. Mariska, and J. T. Karpen. **315**, 385, 44-B5 (1987)
- PILIPP, W. The Effects of Dust on the Propagation and Dissipation of Alfvén Waves in Interstellar Clouds. W. Pilipp, T. W. Hartquist, O. Havnes, and G. E. Morfill. **314**, 341, 37-G9 (1987)
- PINEAULT, S. VRO 42.05.01: A Supernova Remnant Reenergizing an Interstellar Cavity. S. Pineault, T. L. Landecker, and D. Routledge. **315**, 580, 47-A10 (1987)
- PINTO, P. A. Supernova 1987A in the Large Magellanic Cloud: The Explosion of a $\sim 20 M_{\odot}$ Star Which Has Experienced Mass Loss? S. E. Woosley, P. A. Pinto, P. G. Martin, and Thomas A. Weaver. **318**, 664, 88-B11 (1987)
- PIPHER, JUDITH L. The Dust Shells of NML Cygnus and IRC 10420: Inner Radius, Temperature, and Optical Thickness: Erratum. Stephen T. Ridgway, Richard R. Joyce, Dennis Connors, Judith L. Pipher, and Christopher Dainty. **312**, 963, 13-E1 (1987) (Orig. paper in **302**, 662, 37-G8)
- PIRAN, TSVI. Gravitational Lenses and Decay of Dark Matter. Avishai Dekel and Tsvi Piran. **315**, L83, 49-B6 (1987)
- PIRO, L. First Unambiguous X-Ray Detection of R Aquarii. R. Viotti, L. Piro, M. Friedjung, and A. Cassatella. **319**, L7, 100-A10 (1987)
- PLAMBECK, R. L. Aperture Synthesis Maps of HDO Emission in Orion-KL. R. L. Plambeck and M. C. H. Wright. **317**, L101, 78-E4 (1987)
- VLBI Structure of 3C 84 at 89 GHz. D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman. **322**, 74, 138-F11 (1987)
- PLUMMER, GRANT M. C-Type Transitions in Methyl Formate. Grant M. Plummer, Eric Herbst, and Frank C. De Lucia. **318**, 873, 90-F2 (1987)
- PODOLAK, MORRIS. Radiogenic Heating of Comets by ^{26}Al and Implications for Their Time of Formation. Dina Prialnik, Akiva Bar-Nun, and Morris Podolak. **319**, 993, 105-G1 (1987)
- POGGE, RICHARD W. FY Aquilae and the Gamma-Ray Burst Event of 1979 March 31. Dieter Hartmann and Richard W. Pogge. **318**, 363, 82-G4 (1987)
- Optical Spectra of Narrow Emission Line Palomar-Green Galaxies. Donald E. Osterbrock and Richard W. Pogge. **323**, 108, 154-C4 (1987)
- POLITZER, H. DAVID. Interpretation of Large-Scale Deviations from the Hubble Flow. B. Grinstein, H. David Politzer, S.-J. Rey, and Mark B. Wise. **314**, 431, 34-C1 (1987)
- POLLOCK, A. M. T. The Einstein View of the Wolf-Rayet Stars. A. M. T. Pollock. **320**, 283, 111-B12 (1987)
- POPPEL, W. G. L. Comet Halley: OH Absorption of Galactic Background Radio Sources. E. Bajaja, E. M. Arnal, J. C. Cerosimo, F. R. Colomb, M. C. Martin, J. Mazzaro, R. Morras, J. C. Olalde, W. G. L. Poppel, A. M. Silva, I. F. Mirabel, and V. Boriakoff. **313**, 906, 26-F2 (1987)
- PÖPPEL, W. G. L. Observation of the OH 1667 MHz Line toward Comet Halley from the Southern Hemisphere. E. Bajaja, R. Morras, W. G. L. Poppel, J. E. Cerosimo, M. C. Martin, J. Mazzaro, J. C. Olalde, A. Silva, E. M. Arnal, F. R. Colomb, I. F. Mirabel, and V. Boriakoff. **322**, 549, 144-A1 (1987)
- POPPEL, DANIEL M. A Pre-Main-Sequence Star in the Detached Binary EK Cephei. Daniel M. Popper. **313**, L81, 27-D7 (1987)
- POQUÉRUSSÉ, M. Radio Evidence for a Magnetic Mirror Effect on Beams of Subrelativistic Electrons in the Solar Corona. C. Caroubalos, M. Poquéruisse, J.-L. Bourgeret, and R. Crépel. **319**, 503, 98-F7 (1987)
- PORTER, J. G. Microfilaments in the Solar Magnetic Network. J. G. Porter, R. L. Moore, E. J. Reichmann, E. Engvold, and K. L. Harvey. **323**, 380, 157-C5 (1987)
- PORTER, J. L. A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengston, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan. **313**, 920, 26-G3 (1987)
- PORTUGAL, R. Magnetohydrodynamic Cosmologies with a Bertotti-Robinson-like Limit. R. Portugal and I. Damião Soares. **316**, 483, 57-C9 (1987)
- PRADHAN, A. K. Electron Excitation of Fine-Structure Transitions within the Ground $3s^2 3p^3$ Configuration in Fe XII. S. S. Tayal, Ronald J. W. Henry, and A. K. Pradhan. **319**, 951, 105-C13 (1987)
- PRANTZOS, N. Neutron Capture Nucleosynthesis during Core Helium Burning in Massive Stars. N. Prantzos, M. Arnould, and J.-P. Arcoragi. **315**, 209, 42-C6 (1987)
- PRATHER, MICHAEL J. The Role of Aqueous Chemistry in Determining the Composition and Cloud Structure of the Upper Troposphere of Uranus. Barbara E. Carlson, Michael J. Prather, and William B. Rossow. **321**, L97, 130-B3 (1987)
- Cloud Chemistry on Jupiter. Barbara E. Carlson, Michael J. Prather, and William B. Rossow. **322**, 559, 144-A11 (1987)
- PRAVDO, STEVEN H. Observation of the HH 1 and 2 Region with IRAS. Steven H. Pravdo and Thomas J. Chester. **314**, 308, 31-D13 (1987)
- PREDMORE, C. R. VLBI Structure of 3C 84 at 89 GHz. D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman. **322**, 74, 138-F11 (1987)
- PREECE, ROBERT. Quantized Synchrotron Radiation in Strong Magnetic Fields. Alice K. Harding and Robert Preece. **319**, 939, 105-C1 (1987)
- PRESNELL, A. K. The Perseus Flasher and Satellite Glints. Bradley E. Schaefer, Michael Barber, John J. Brooks, Allen DeForrest, Paul D.

- Maley, Norman W. McLeod III, Russ McNeil, Andrew J. Noymer, A. K. Presnell, Richard Schwartz, and Scott Whitney. **320**, 398, 112-D2 (1987)
- PRESS, W. H. Is Solar Neutrino Capture Rate Correlated with Sunspot Number? *J. N. Bahcall, G. B. Field, and W. H. Press.* **320**, L69, 114-F1 (1987)
- PRESTON, R. A. VLBI Observations of 23 Hot Spots in the Starburst Galaxy M82. *N. Bartel, M. I. Ratner, A. E. E. Rogers, I. I. Shapiro, R. J. Bonometti, N. L. Cohen, M. V. Gorenstein, J. M. Marcaide, and R. A. Preston.* **323**, 505, 160-B3 (1987)
- PRIALNIK, DINA. On the Evolution and Activity of Cometary Nuclei. *Dina Prialnik and Akiva Bar-Nun.* **313**, 893, 26-E3 (1987)
- Radiogenic Heating of Comets by ^{26}Al and Implications for Their Time of Formation. *Dina Prialnik, Akiva Bar-Nun, and Morris Podolak.* **319**, 993, 105-G1 (1987)
- PRICE, S. D. IRAS Large-Beam and Ground-Based Small-Beam Measurements of the Unidentified 11.3 and [Ne II] 12.8 Micron Line Fluxes in the Starburst Galaxy M82. *P. D. LeVan and S. D. Price.* **312**, 592, 9-D1 (1987)
- PRICE, T. R. A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. *M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengtson, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan.* **313**, 920, 26-G3 (1987)
- PRIEDHORSKY, W. The Discovery of a Second Orbital Period from the X-Ray Source 4U 1820 - 30 in the Globular Cluster NGC 6624. *L. Stella, W. Friedhorsky, and N. E. White.* **312**, L17, 7-B4 (1987)
- The Discovery of 15-30 Hertz Quasi-periodic Oscillations in the X-Ray flux of 4U 1820 - 30. *L. Stella, N. E. White, and W. Friedhorsky.* **315**, L49, 45-E3 (1987)
- PRIEDHORSKY, W. C. Search for Orbital X-Ray Variation in Scorpius X-1. *W. C. Friedhorsky and S. S. Holt.* **312**, 743, 11-A13 (1987)
- EXOSAT Observations of Double-peaked Bursts with Radius Expansion from 4U/MXB 1820 - 30. *F. Haberl, L. Stella, N. E. White, W. C. Friedhorsky, and M. Gottwald.* **314**, 266, 31-A9 (1987)
- PRINGLE, J. E. The Formation of the Exponential Disk in Spiral Galaxies. *D. N. C. Lin and J. E. Pringle.* **320**, L87, 121-B6 (1987)
- PRINJA, RAMAN K. Ultraviolet Observations of Extensive Variability in the Stellar Wind of ξ Persei. *Raman K. Prinja, Ian D. Howarth, and Huib F. Henrichs.* **317**, 389, 68-B11 (1987)
- PRITCHET, C. J. A Search for Primeval Galaxies Using a Narrow-Band Imaging Technique. *C. J. Pritchett and F. D. A. Hartwick.* **320**, 464, 114-E2 (1987)
- PRITCHET, CHRISTOPHER J. Observations of RR Lyrae Stars in the Halo of M31. *Christopher J. Pritchett and Sidney van den Bergh.* **316**, 517, 57-F2 (1987)
- Observations of Novae in the Virgo Cluster. *Christopher J. Pritchett and Sidney van den Bergh.* **318**, 507, 86-D7 (1987)
- The Late-Type Stellar Content of NGC 55. *Christopher J. Pritchett, Harvey B. Richer, David Schade, Dennis Crabtree, and H. K. C. Yee.* **323**, 79, 154-A3 (1987)
- PROTHEROE, R. J. Constraints on Models of Cygnus X-3 from High-Energy Gamma-Ray Absorption at Source. *R. J. Protheroe and Todor Stanev.* **322**, 838, 149-A8 (1987)
- PUDRITZ, RALPH E. Ionization-regulated Star Formation in Magnetized Molecular Clouds. *Ralph E. Pudritz and Joseph Silk.* **316**, 213, 52-C10 (1987)
- PUETTER, R. C. The Velocity Distribution of Quasar/AGN Broad Emission Line Clouds. *R. C. Puetter and E. N. Hubbard.* **320**, 85, 109-A6 (1987)
- QUINLAN, GERALD D. The Collapse of Dense Star Clusters to Supermassive Black Holes: Binaries and Gravitational Radiation. *Gerald D. Quinlan and Stuart L. Shapiro.* **321**, 199, 124-D2 (1987)
- QUINN, P. J. Shells and Dark Matter in Elliptical Galaxies. *Lars Hernquist and P. J. Quinn.* **312**, 1, 1-A7 (1987)
- Shell Galaxies and Alternatives to the Dark Matter Hypothesis. *Lars Hernquist and P. J. Quinn.* **312**, 17, 1-B9 (1987)
- RADICK, RICHARD R. The Activity, Variability, and Rotation of Lower Main-Sequence Hyades Stars. *Richard R. Radick, D. T. Thompson, G. W. Lockwood, D. K. Duncan, and W. E. Baggett.* **321**, 459, 127-B10 (1987)
- RAGA, A. C. Ultraviolet Spectra of HH 1 and HH 2: Spatial Variations and the Continuum Problem. *K. H. Böhm, Th. Bührke, A. C. Raga, E. W. Bruge, A. N. Witt, and R. Mundt.* **316**, 349, 53-G7 (1987)
- Time-dependent Bow Shocks and the Condensation Structure of Herbig-Haro Objects. *A. C. Raga and K. H. Böhm.* **323**, 193, 155-B10 (1987)
- RAMATY, R. Positrons from Accelerated Particle Interactions. *B. Kozlovsky, R. E. Lingenfelter, and R. Ramaty.* **316**, 801, 60-G6 (1987)
- On the Origin of the Pion-Decay Radiation in the 1982 June 3 Solar Flare. *R. Ramaty, R. J. Murphy, and C. D. Dermer.* **316**, L41, 56-D3 (1987)
- High-Energy Processes in Solar Flares. *R. J. Murphy, C. D. Dermer, and R. Ramaty.* **63**, 721, 11-D13 (1987) (Abstr. in **313**, 931, 26-G14)
- RAMSEY, LAWRENCE W. CCD Echelle Observations of the Active RS CVn System II Pegasi. *David P. Huenemoerder and Lawrence W. Ramsey.* **319**, 392, 97-D5 (1987)
- A Flare Event on the Long-Period RS Canum Venaticorum System IM Pegasi. *Derek L. Buzasi, Lawrence W. Ramsey, and David P. Huenemoerder.* **322**, 353, 141-F8 (1987)
- RANGACHARYULU, C. Radiative Transitions in ^{27}Al and Their Relevance to the $^{26}\text{Al}(p,\gamma)^{27}\text{Si}$ Reaction under Stellar Conditions. *C. Rangacharyulu, G. Kuechler, A. Richter, and E. Spamer.* **320**, 405, 112-D9 (1987)
- RANK, DAVID M. Observations of Infrared Emission from a Fast-moving Knot in Cassiopeia A. *Harriet L. Dinerstein, Daniel F. Lester, David M. Rank, Michael W. Werner, and Diane H. Wooden.* **312**, 314, 4-C11 (1987)
- RAO, MEENAKSHI. Lower Bounds on the Masses of Rapidly Rotating White Dwarfs. *G. Channugam, Meenakshi Rao, and Joel E. Tohline.* **319**, 188, 95-A13 (1987)
- RAPPAPORT, S. The Core Mass-Radius Relation for Giants: A New Test of Stellar Evolution Theory. *P. C. Joss, S. Rappaport, and W. Lewis.* **319**, 180, 95-A5 (1987)
- The Evolutionary Status of 4U 1820 - 30. *S. Rappaport, L. A. Nelson, C. P. Ma, and P. C. Joss.* **322**, 842, 149-A12 (1987)
- RATCLIFF, STEPHEN J. Theoretical Stellar Luminosity Functions and the Ages and Compositions of Globular Clusters. *Stephen J. Ratcliff.* **318**, 196, 81-A13 (1987)
- RATNATUNGA, KAVAN U. An Analysis of the Yale Bright Star Catalog. *John N. Bahcall, Stefano Casertano, and Kavan U. Ratnatunga.* **320**, 515, 115-B10 (1987)
- RATNER, M. I. VLBI Observations of 23 Hot Spots in the Starburst Galaxy M82. *N. Bartel, M. I. Ratner, A. E. E. Rogers, I. I. Shapiro, R. J. Bonometti, N. L. Cohen, M. V. Gorenstein, J. M. Marcaide, and R. A. Preston.* **323**, 505, 160-B3 (1987)
- RAWLEY, LLOYD A. Improved Timing of the Millisecond Pulsar PSR 1937 + 21 Using Real-Time Coherent Dedispersion. *T. H. Hankins, Daniel R. Stinebring, and Lloyd A. Rawley.* **315**, 149, 41-F1 (1987)
- RAY, A. Late-Time Neutrino Heating and Energetics of Stalled Shocks in Type II Supernovae. *A. Ray and K. Kar.* **319**, 143, 94-E9 (1987)
- RAYMOND, J. C. The Interstellar Medium toward Supernova 1987A. *A. K. Dupree, R. P. Kirshner, G. E. Nassiopoulou, J. C. Raymond, and G. Sonneborn.* **320**, 597, 116-B11 (1987)
- RAYMOND, JOHN. Radiative Bow Shock Models of Herbig-Haro Objects. *Patrick Hartigan, John Raymond, and Lee Hartmann.* **316**, 323, 53-D14 (1987)
- RAYMOND, JOHN C. IUE Observations of the Dwarf Nova HL Canis Majoris and the Winds of Cataclysmic Variables. *Christopher W. Mauche and John C. Raymond.* **323**, 690, 162-C6 (1987)
- RE, S. Time Variability of Gamma Cassiopeiae in X-Rays. *F. Frontera, D. Dal Fiume, N. R. Robba, G. Manzo, S. Re, and E. Costa.* **320**, L127, 121-D13 (1987)
- READHEAD, A. C. S. Superluminal Motion in the Double-lobed Quasar 3C 245. *D. H. Hough and A. C. S. Readhead.* **321**, L11, 129-C1 (1987)
- VLBI Structure of 3C 84 at 89 GHz. *D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman.* **322**, 74, 138-F11 (1987)
- REALE, F. Hydrodynamic Flare Modeling: Comparison of Numerical Calculations with SMM Observations of the 1980 November 12 17:00 UT Flare. *G. Peres, F. Reale, S. Serio, and R. Pallavicini.* **312**, 895, 12-F5 (1987)
- REES, D. E. Stokes Profile Analysis and Vector Magnetic Fields. III. Extended Temperature Minima of Sunspot Umbrae as inferred from Stokes Profiles of Mg I $\lambda 4571$. *B. W. Lites, A. Skumanich, D. E. Rees, G. A. Murphy, and M. Carlsson.* **318**, 930, 91-B6 (1987)
- REES, MARTIN J. Thermal and Dynamical Effects of Pair Production on Two-Temperature Accretion Flows. *Mitchell C. Begelman, Marek Sikora, and Martin J. Rees.* **313**, 689, 24-C12 (1987)
- Effects of Electron-Positron Pair Opacity for Spherical Accretion onto Black Holes. *Alan P. Lightman, Andrzej A. Zdziarski, and Martin J. Rees.* **315**, L113, 49-D8 (1987)
- REGEV, ODED. Massive Disk Formation from the Collision of a Main-Sequence Star with a White Dwarf in a Globular Cluster Core. *Noam*

- Soker, Oded Regev, Mario Livio, and Michael M. Shara. **318**, 760, 89-C4 (1987)
- REICHMANN, E. J. Microflares in the Solar Magnetic Network. *J. G. Porter, R. L. Moore, E. J. Reichmann, E. Engold, and K. L. Harvey.* **323**, 380, 157-C5 (1987)
- REID, M. J. X-Rays from the Radio Halo of M87. *E. D. Feigelson, P. A. D. Wood, E. J. Schreier, D. E. Harris, and M. J. Reid.* **312**, 101, 2-B5 (1987)
- REID, MARK J. The Circumstellar Envelope of W3(OH): NH₃ Observations. *Mark J. Reid, Philip C. Myers, and John H. Bieging.* **312**, 830, 12-A9 (1987)
- Compact Continuum Radio Sources in the Orion Nebula. *Guido Garay, James M. Moran, and Mark J. Reid.* **314**, 535, 35-D2 (1987)
- Gravitational Collapse in Molecular Cloud Cores around Ultracompact H II Regions: Two Candidates. *Eric R. Keto, Paul T. P. Ho, and Mark J. Reid.* **323**, L117, 164-C1 (1987)
- REID, NEILL. The Evolution of Asymptotic Giant Branch Stars in the Magellanic Clouds. III. The Problem of Intermediate-Mass Stars. *Jeremy Mould and Neill Reid.* **321**, 156, 124-A1 (1987)
- The Stellar Populations of Shapley Constellation III. *Neill Reid, Jeremy Mould, and Ian Thompson.* **323**, 433, 159-C11 (1987)
- REIDL, CHARLES J., JR. Gravity in One Dimension: Selective Relaxation? *Charles J. Reidl, Jr. and Bruce N. Miller.* **318**, 248, 81-E10 (1987)
- REINES, F. see SVOBODA, R. et al.
- REMILLARD, R. A. Discovery of Three New RS Canum Venaticorum-like Counterparts to HEAO 1 X-Ray Sources. *D. A. H. Buckley, I. R. Tuohy, R. A. Remillard, H. V. Bradt, and D. A. Schwartz.* **315**, 273, 42-G14 (1987)
- RENZINI, ALVIO. On the Interpretation of the Sandage Period-Shift Effect among Globular Cluster RR Lyrae Variables. *Allen V. Sweigart, Alvio Renzini, and Amedeo Tornambè.* **312**, 762, 11-C4 (1987)
- REPHAELI, Y. HEAO 1 Hard X-Ray Observations of Three Abell Clusters of Galaxies. *Y. Rephaeli, D. E. Gruber, and R. E. Rothschild.* **320**, 139, 109-E5 (1987)
- REY, S.-J. Interpretation of Large-Scale Deviations from the Hubble Flow. *B. Grinstein, H. David Politzer, S.-J. Rey, and Mark B. Wise.* **314**, 431, 34-C1 (1987)
- REYNOLDS, ANNE P. On the Distribution of Colors for Stars in the Ninth to Fifteenth Magnitude Range: Statistics and Implications for Galactic Structure. *Barry M. Lasker, Peter M. Garnavich, and Anne P. Reynolds.* **320**, 502, 115-A3 (1987)
- REYNOLDS, R. J. Detection of an Extremely Faint Emission Nebula Surrounding the Hot White Dwarf PG 0108 + 101. *R. J. Reynolds.* **315**, 234, 42-E3 (1987)
- A View of the Galactic H α Background: $208^\circ \leq l \leq 218^\circ$; $-2^\circ \leq b \leq +8^\circ$. *R. J. Reynolds.* **323**, 118, 154-D2 (1987)
- H α Scans of High-Velocity Clouds. *R. J. Reynolds.* **323**, 553, 160-F11 (1987)
- REYNOLDS, STEPHEN P. A Radio Search for Crab-like Nebulae in M33. *Stephen P. Reynolds and John D. Fix.* **322**, 673, 147-B7 (1987)
- RHODES, T. L. A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. *M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengtson, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan.* **313**, 920, 26-G3 (1987)
- RICE, W. L. Physical Processes and Infrared Emission from the Cassiopeia A Supernova Remnant. *E. Dwek, H. L. Dinerstein, F. C. Gillett, M. G. Hauser, and W. L. Rice.* **315**, 571, 47-A1 (1987)
- The IRAS Bright Galaxy Sample. II. The Sample and Luminosity Function. *B. T. Soifer, D. B. Sanders, B. F. Madore, G. Neugebauer, G. E. Danielson, J. H. Elias, Carol J. Lonsdale, and W. L. Rice.* **320**, 238, 110-F7 (1987)
- RICE, WALTER L. IRAS Observations of Supernova Remnants: A Comparison between Their Infrared and X-Ray Cooling Rates. *Eli Dwek, Robert Petre, Andrew Szymkowiak, and Walter L. Rice.* **320**, 27, 114-C4 (1987)
- RICHARDS, B. A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. *M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengtson, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan.* **313**, 920, 26-G3 (1987)
- RICHARDSON, MARTIN B. Thermal Evolution of Accreting Neutron Stars. II. Long X-Ray Bursts as a Probe Into the Interior. *Masayuki Y. Fujimoto, Tomoyuki Hanawa, Icko Iben, Jr., and Martin B. Richardson.* **315**, 198, 42-B9 (1987)
- RICHER, HARVEY B. Deep CCD Photometry in Globular Clusters. V. M5. *Harvey B. Richer and Gregory G. Fahlman.* **316**, 189, 52-A13 (1987)
- The Late-Type Stellar Content of NGC 55. *Christopher J. Pritchett, Harvey B. Richer, David Schade, Dennis Crabtree, and H. K. C. Yee.* **323**, 79, 154-A3 (1987)
- RICHSTONE, DOUGLAS O. Triaxial Scale-free Models of Highly Flattened Elliptical Galaxies with and without Massive Halos. *Harold F. Leison and Douglas O. Richstone.* **314**, 476, 34-F9 (1987)
- RICHTER, A. Radiative Transitions in ²⁷Al and Their Relevance to the ²⁶Al(p, γ)²⁷Si Reaction under Stellar Conditions. *C. Rangacharyulu, G. Kuechler, A. Richter, and E. Spamer.* **320**, 405, 112-D9 (1987)
- RICKARD, LEE J. Hydrodynamical Processes in the Draco Molecular Cloud. *Sten F. Odenwald and Lee J. Rickard.* **318**, 702, 88-E7 (1987)
- RICKETT, B. J. Refractive Scintillation in the Interstellar Medium. *W. A. Coles, R. G. Frehlich, B. J. Rickett, and J. L. Codona.* **315**, 666, 48-A1 (1987)
- RIDGWAY, STEPHEN T. The Dust Shells of NML Cygnus and IRC 10420: Inner Radius, Temperature, and Optical Thickness: Erratum. *Stephen T. Ridgway, Richard R. Joyce, Dennis Connors, Judith L. Piper, and Christopher Dainty.* **312**, 963, 13-E1 (1987) (Orig. paper in **302**, 662, 37-G8)
- RIEGER, E. The Directivity of High-Energy Emission from Solar Flares. II. Solar Maximum Mission Observations. *W. Thomas Vestrand, D. J. Forrest, E. L. Chupp, E. Rieger, and G. H. Share.* **322**, 1010, 151-A7 (1987)
- RIEKE, G. H. Broad-Band Properties of the CTA Seyfert Galaxies. II. Infrared to Millimeter Properties. *R. A. Edelson, M. A. Malkan, and G. H. Rieke.* **321**, 233, 124-G1 (1987)
- RIFFERT, H. On the Radius of Neutron Stars. *P. Mészáros and H. Riffert.* **323**, L127, 164-D3 (1987)
- RITTER, H. The Evolution of Magnetic Cataclysmic Variables. *J. M. Hameury, A. R. King, J. P. Lasota, and H. Ritter.* **316**, 275, 53-A9 (1987)
- RITZ, C. P. A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. *M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengtson, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan.* **313**, 920, 26-G3 (1987)
- RIVOLI, A. R. Mass, Luminosity, and Line Width Relations of Galactic Molecular Clouds. *P. M. Solomon, A. R. Rivoli, J. Barrett, and A. Yahil.* **319**, 730, 103-A8 (1987)
- ROBBA, N. R. Time Variability of Gamma Cassiopeiae in X-Rays. *F. Frontera, D. Dal Fiume, N. R. Robba, G. Manzo, S. Re, and E. Costa.* **320**, L127, 121-D13 (1987)
- ROBERTS, B. On Magnetohydrodynamic Solitons in Jets. *B. Roberts.* **318**, 590, 87-D1 (1987)
- ROBERTS, D. H. Linear Polarization Structure of the BL Lacertae Object OJ 287 at Milliarcsecond Resolution. *D. H. Roberts, D. C. Gabuzda, and J. F. C. Wardle.* **323**, 536, 160-E5 (1987)
- ROBERTS, WILLIAM W., JR. The Role of Orbital Dynamics and Cloud-Cloud Collisions in the Formation of Giant Molecular Clouds in Global Spiral Structures. *William W. Roberts, Jr. and Glen R. Stewart.* **314**, 10, 28-B4 (1987)
- ROBINSON, EDWARD L. Detection of Superhumps and Quasi-periodic Oscillations in the Light Curve of the Dwarf Nova SW Ursae Majoris. *Edward L. Robinson, Allen W. Shafter, J. Allen Hill, Matt A. Wood, and Janet A. Mattei.* **313**, 772, 25-C2 (1987)
- The Eclipses of Cataclysmic Variables. II. U Geminorum. *E.-H. Zhang and Edward L. Robinson.* **321**, 813, 133-D8 (1987)
- An Upper Limit to the Space Density of Short-period Noninteracting Binary White Dwarfs. *Edward L. Robinson and Allen W. Shafter.* **322**, 296, 141-B1 (1987)
- RODRIGUEZ, L. F. OH Outflows in Star-forming Regions. I. *F. Mirabel, A. Ruiz, L. F. Rodriguez, and J. Cantó.* **318**, 729, 89-A1 (1987)
- Are the High-Velocity Molecular Flows Really Clumpy? *J. Cantó, L. F. Rodriguez, and G. Anglada.* **321**, 877, 134-B11 (1987)
- RODRIGUEZ, LUIS F. Interaction of the High-Density Gas with the Bipolar Outflow in Cepheus A. *José M. Torrelles, Paul T. P. Ho, Luis F. Rodriguez, Jorge Cantó, and James M. Moran.* **321**, 884, 134-C4 (1987)
- RODRIGUEZ ESPINOSA, J. M. Star Formation in Seyfert Galaxies. *J. M. Rodriguez Espinosa, Richard J. Rudy, and Barbara Jones.* **312**, 555, 9-A1 (1987)
- ROELLIG, T. Submillimeter Diagnostics of the Response of the Solar Chromosphere to Compressional Waves. *C. Lindsey and T. Roellig.* **313**, 877, 26-D1 (1987)
- ROGERS, A. E. E. VLBI Structure of 3C 84 at 89 GHz. *D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman.* **322**, 74, 138-F11 (1987)
- VLBI Observations of 23 Hot Spots in the Starburst Galaxy M82. *N.*

- Bartel, M. I., Ratner, A. E. E., Rogers, I. I., Shapiro, R. J., Bonometti, N. L., Cohen, M. V., Gorenstein, J. M., Marcaide, and R. A. Preston. **323**, 505, 160-B3 (1987)
- ROGERS, C. Thermal Emission from Bok Globules. *Man Hoi Lee and C. Rogers*. **317**, 197, 66-B8 (1987)
- Carbon Grains in the Envelope of IRC +10216. P. G. Martin and C. Rogers. **322**, 374, 142-A1 (1987)
- ROGERS, F. J. Reexamination of the Metal Contribution to Astrophysical Opacity. C. A. Iglesias, F. J. Rogers, and B. G. Wilson. **322**, L45, 145-D2 (1987)
- ROGERS, R. D. Determination of Photospheric Helium Abundances for the Hot White Dwarfs LB 1663 and CD - 38° 10980 from EXOSAT Soft X-Ray Photometry. F. B. S. Paerels, J. Heise, S. M. Kahn, and R. D. Rogers. **322**, 315, 141-C6 (1987)
- ROGERSON, JOHN B., JR. The Copernicus Ultraviolet Spectral Atlas of Sirius. John B. Rogers, Jr. **63**, 369, 6-A13 (1987) (Abstr. in **312**, 966, 13-E7)
- ROMANI, ROGER W. Model Atmospheres for Cooling Neutron Stars. *Roger W. Romani*. **313**, 718, 24-E13 (1987)
- ROMANISHIN, W. Imaging Redshift Estimates for Two BL Lacertae Objects. W. Romanishin. **320**, 586, 116-A14 (1987)
- An Imaging Study of NGC 1275 and PKS 0745 - 191: Vigorous Star Formation in Cooling Flow Cluster Dominant Galaxies. W. Romanishin. **323**, L113, 164-B9 (1987)
- ROMNEY, JONATHAN D. Multiphase VLBI Observations of 4C 39.25: Superluminal Motion and Stationary Structure. David B. Shaffer, Alan P. Marscher, Jon Marcaide, and Jonathan D. Romney. **314**, L1, 33-B4 (1987)
- 18 Centimeter VLBI Observations of the Quasar NRAO 140 during and after a Low-Frequency Outburst. Alan P. Marscher, John J. Broderick, Lucia Padrielli, Norbert Bartel, and Jonathan D. Romney. **319**, 456, 98-B8 (1987)
- The Inner Beams of SS 433. Jonathan D. Romney, Richard T. Schilizzi, István Fejes, and Ralph E. Spencer. **321**, 822, 133-E3 (1987)
- ROOD, HERBERT J. Results from a Visual Survey of All 2712 Abell Clusters. Mitchell F. Struble and Herbert J. Rood. **323**, 468, 159-F4 (1987)
- Neutral Hydrogen in Compact Groups of Galaxies. B. A. Williams and Herbert J. Rood. **63**, 265, 4-C8 (1987) (Abstr. in **312**, 964, 13-E5)
- A Compilation of Redshifts and Velocity Dispersions for Abell Clusters. Mitchell F. Struble and Herbert J. Rood. **63**, 543, 9-C7 (1987) (Abstr. in **313**, 928, 26-G11)
- A Catalog of Morphological Properties of the 2712 Abell Clusters. Mitchell F. Struble and Herbert J. Rood. **63**, 555, 9-D4 (1987) (Abstr. in **313**, 929, 26-G12)
- ROOD, ROBERT T. Measurements of the ^3He Abundance in the Interstellar Medium. T. M. Bania, Robert T. Rood, and T. L. Wilson. **323**, 30, 153-D3 (1987)
- ROSA, MICHAEL. On the Chemical Homogeneity of the 30 Doradus H II Region and a Local Enrichment by Wolf-Rayet Stars. Michael Rosa and John S. Mathis. **317**, 163, 65-F11 (1987)
- ROSE, W. K. Radiation from Relativistic Beams Interacting with Interstellar Gas. W. K. Rose, J. H. Beall, J. Guillory, and S. Kainer. **314**, 95, 29-A12 (1987)
- ROSE, WILLIAM K. Infrared Continuum Radiation from Red Giants. William K. Rose. **312**, 284, 4-A9 (1987)
- Magnetic Fields in Extragalactic Jets. William K. Rose. **313**, 146, 16-E10 (1987)
- ROSEN, NATHAN. Mass Accretion on a Collapsed Star. Amos Harpaz and Nathan Rosen. **312**, 646, 10-A7 (1987)
- ROSEN, PAUL A. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. John D. Anderson, Timothy P. Krisher, Susan E. Borutski, Michael J. Connolly, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen. **323**, L141, 164-E1 (1987)
- ROSEN, R. Current-driven Magnetohydrodynamic Thermal Instabilities in Sheared Fields. G. Bodo, A. Ferrari, S. Massaglia, and R. Rosner. **313**, 432, 19-F10 (1987)
- Variability Analysis in Low Count Rate Sources. A. Collura, A. Maggio, S. Sciortino, S. Serio, G. S. Vaiana, and R. Rosner. **315**, 340, 43-E11 (1987)
- A Computational Code for Two-dimensional Unsteady Magnetohydrodynamics by the Method of Characteristics. Y. Q. Lou, R. Rosner, and P. Ulmschneider. **315**, 349, 43-F6 (1987)
- On the Generation of Magnetohydrodynamic Waves in a Stratified and Magnetized Fluid. I. Vertical Propagation. Z. E. Musielak and R. Rosner. **315**, 371, 44-A5 (1987)
- Einstein Observatory Survey of X-Ray Emission from Solar-Type Stars: The Late F and G Dwarf Stars. A. Maggio, S. Sciortino, G. S. Vaiana, P. Majer, J. Bookbinder, L. Golub, F. R. Harnden, Jr., and R. Rosner. **315**, 687, 48-B8 (1987)
- On the Thermal Instability of Galactic and Cluster Halos. A. Malagoli, R. Rosner, and G. Bodo. **319**, 622, 101-G8 (1987)
- Simulations of the Ca XIX Spectral Emission from a Flaring Solar Coronal Loop. I. Thermal Case. E. Antonucci, M. A. Doderio, G. Peres, S. Serio, and R. Rosner. **322**, 522, 143-F1 (1987)
- ROSSANO, GEORGE S. Airborne Spectrophotometry of Eta Carinae from 4.5 to 7.5 Microns and a Model for Source Morphology. Ray W. Russell, David K. Lynch, John A. Hackwell, Richard J. Rudy, George S. Rossano, and M. W. Castelaz. **321**, 937, 134-G1 (1987)
- RÖSSER, HERMANN-JOSEF. A Bright Optical Synchrotron Counterpart of the Western Hot Spot in Pictor A. Hermann-Josef Rösser and Klaus Meisenheimer. **314**, 70, 28-G1 (1987)
- ROSSOW, WILLIAM B. The Role of Aqueous Chemistry in Determining the Composition and Cloud Structure of the Upper Troposphere of Uranus. Barbara E. Carlson, Michael J. Prather, and William B. Rossow. **321**, L97, 130-B3 (1987)
- Cloud Chemistry on Jupiter. Barbara E. Carlson, Michael J. Prather, and William B. Rossow. **322**, 559, 144-A11 (1987)
- ROTH, DUANE C. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. John D. Anderson, Timothy P. Krisher, Susan E. Borutski, Michael J. Connolly, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen. **323**, L141, 164-E1 (1987)
- ROTH, M. X-Ray Sources in Regions of Star Formation. II. The Pre-Main-Sequence G Star HDE 283572. F. M. Walter, A. Brown, J. L. Linsky, A. E. Rydgren, F. Vrba, M. Roth, L. Carrasco, P. F. Chugainov, N. I. Shakovskaya, and C. L. Imhoff. **314**, 297, 31-D2 (1987)
- ROTHSCHILD, R. E. HEAO 1 Hard X-Ray Observations of Three Abell Clusters of Galaxies. Y. Rephaeli, D. E. Gruber, and R. E. Rothschild. **320**, 139, 109-E5 (1987)
- ROTHSCHILD, RICHARD E. Two Binary Cycles of GX 301 - 2. Richard E. Rothschild and Yang Soong. **315**, 154, 41-F6 (1987)
- A Rapid Change of the Hercules X-1 Pulse Profile and High-State Duration. Yang Soong, Duane E. Gruber, and Richard E. Rothschild. **319**, L77, 107-E3 (1987)
- ROUTLEDGE, D. VRO 42.05.01: A Supernova Remnant Reenergizing an Interstellar Cavity. S. Pineault, T. L. Landecker, and D. Routledge. **315**, 580, 47-A10 (1987)
- ROWAN, W. L. A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengtson, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan. **313**, 920, 26-G3 (1987)
- ROWAN-ROBINSON, M. A Model for the Emission from the Bulge of Our Galaxy. M. Rowan-Robinson and T. Chester. **313**, 413, 19-E4 (1987)
- ROY, JEAN-RENÉ. Nitrogen Abundances in the Amorphous Galaxy NGC 5253. Jeremy R. Walsh and Jean-René Roy. **319**, L57, 107-C9 (1987)
- RUBIN, VERA C. Evidence for a Central Massive Component in Late-Type Spirals. Vera C. Rubin and J. A. Graham. **316**, L67, 62-B12 (1987)
- RUDY, RICHARD J. Star Formation in Seyfert Galaxies. J. M. Rodriguez Espinosa, Richard J. Rudy, and Barbara Jones. **312**, 555, 9-A1 (1987)
- Airborne Spectrophotometry of Eta Carinae from 4.5 to 7.5 Microns and a Model for Source Morphology. Ray W. Russell, David K. Lynch, John A. Hackwell, Richard J. Rudy, George S. Rossano, and M. W. Castelaz. **321**, 937, 134-G1 (1987)
- RUIZ, A. OH Outflows in Star-forming Regions. I. F. Mirabel, A. Ruiz, L. F. Rodriguez, and J. Cantó. **318**, 729, 89-A1 (1987)
- RUIZ, M. T. IRAS 18059 - 3211: Optically Known As Gomez's Hamburger: Erratum. M. T. Ruiz, V. Blanco, J. Maza, S. Heathcote, A. Phillips, K. Kawara, C. Anguita, M. Hamuy, and A. Gomez. **320**, L157, 121-F14 (1987) (Orig. paper in **316**, L21, 56-B10)
- RUIZ, MARIA TERESA. IRAS 1809 - 3211: Optically Known As "Gomez's Hamburger". Maria Teresa Ruiz, Victor Blanco, José Maza, Steve Heathcote, Andrew Phillips, Kimiaki Kawara, Claudio Anguita, Mario Hamuy, and Arturo Gomez. **316**, L21, 56-B10 (1987)
- RUSK, A. C. M. Excitation and Dissociation of Molecular Hydrogen in Shock Waves at Interstellar Densities. J. E. Dove, A. C. M. Rusk, P. H. Cribb, and P. G. Martin. **318**, 379, 83-A11 (1987)
- RUSK, EDWIN T. The Poynting-Robertson Effect of a Rotating Star. Edwin T. Rusk. **320**, 315, 111-E2 (1987)
- RUSSELL, RAY W. Airborne Spectrophotometry of Eta Carinae from 4.5 to 7.5 Microns and a Model for Source Morphology. Ray W. Russell, David K. Lynch, John A. Hackwell, Richard J. Rudy, George S.

- Rossano, and M. W. Castellaz. **321**, 937, 134-G1 (1987)
- RYBARCHYK, LAWRENCE J. Alpha-Burning of ^{14}O . Michael Wiescher, Volker Harms, Joachim Görres, Friedrich-Karl Thielemann, and Lawrence J. Rybarchyk. **316**, 162, 51-F10 (1987)
- RYDEN, BARBARA S. Galaxy Formation by Gravitational Collapse. Barbara S. Ryden and James E. Gunn. **318**, 15, 79-B5 (1987)
- RYDGREN, A. E. X-Ray Sources in Regions of Star Formation. II. The Pre-Main-Sequence G Star HDE 283572. F. M. Walter, A. Brown, J. L. Linsky, A. E. Rydgren, F. Vrba, M. Roth, L. Carrasco, P. F. Chugainov, N. I. Shakovskaya, and C. L. Imhoff. **314**, 297, 31-D2 (1987)
- RYU, DONGSU. The Growth of Linear Perturbations of Adiabatic Shock Waves. Dongsu Ryu and Ethan T. Vishniac. **313**, 820, 25-F8 (1987)
- SACK, N. The Effects of Neutrino Transport on the Collapse of Iron Stellar Cores. E. S. Myra, S. A. Bludman, Y. Hoffman, I. Lichenstadt, N. Sack, and K. A. Van Riper. **318**, 744, 89-B2 (1987)
- SADAKANE, KOZO. The Abundance of Gallium in B-Type Chemically Peculiar Stars: Addendum. Masahide Takada-Hidai, Kozo Sadakane, and Jun Jugaku. **320**, 437, 112-G4 (1987) (Orig. paper in **304**, 425, 58-D14)
- SADJADI, SINA. The Incidence of Close Binaries among Stars of Low Mass: Astrophysical Binaries. Arthur Young, Sina Sadjadi, and Eugene Harlan. **314**, 272, 31-B1 (1987)
- SAGE, LESLIE J. The Extraordinary CO Luminosity of the Far-Infrared Galaxy VII Zw 31: A Possible Proto-Galactic Disk? Leslie J. Sage and P. M. Solomon. **321**, L103, 137-A9 (1987)
- SAHAI, R. A Hot, Low Mass-Loss Rate Inner Envelope in IRC +10216. R. Sahai. **318**, 809, 89-F11 (1987)
- Abundances in Red Giant Stars: Carbon and Oxygen Isotopes in Carbon-rich Molecular Envelopes. P. G. Wannier and R. Sahai. **319**, 367, 97-B2 (1987)
- SAIO, HIDEYUKI. Off-Center Ignition of Nuclear Burning in Merging White Dwarfs. Yasushi Kawai, Hideyuki Saio, and Ken'ichi Nomoto. **315**, 229, 42-D12 (1987)
- A Linear Thermal Stability Analysis for the Vertical Structure of Alpha Model Accretion Disks. Hideyuki Saio, John K. Cannizzo, and J. Craig Wheeler. **316**, 716, 60-A1 (1987)
- SAITO, SHUJI. The Laboratory Observation of the $J = 1-0$, $K = 0$ Transition of the H_2S^+ Ion. Shuji Saito, Satoshi Yamamoto, and Takayoshi Amano. **314**, L27, 33-C14 (1987)
- Detection of Intense Unidentified Lines in TMC-1. Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito. **317**, L111, 78-E14 (1987)
- Laboratory Detection and Astronomical Identification of a New Free Radical, $\text{CCS}(\Sigma^+)$. Shuji Saito, Kentarou Kawaguchi, Satoshi Yamamoto, Masatoshi Ohishi, Hiroko Suzuki, and Norio Kaifu. **317**, L115, 78-F3 (1987)
- Laboratory Detection of a New Carbon-Chain Molecule C_3S and Its Astronomical Identification. Satoshi Yamamoto, Shuji Saito, Kentarou Kawaguchi, Norio Kaifu, Hiroko Suzuki, and Masatoshi Ohishi. **317**, L119, 78-F7 (1987)
- Laboratory and Astronomical Detection of the Cyclic H_3H Radical. Satoshi Yamamoto, Shuji Saito, Masatoshi Ohishi, Hiroko Suzuki, Shin-ichi Ishikawa, Norio Kaifu, and Akinori Murakami. **322**, L55, 145-D12 (1987)
- Laboratory Microwave Spectroscopy of the Vibrational Satellites for the ν_7 and $2\nu_7$ States of C_3H and Their Astronomical Identification. Satoshi Yamamoto, Shuji Saito, M. Guélin, J. Cernicharo, Hiroko Suzuki, and Masatoshi Ohishi. **323**, L149, 164-E8 (1987)
- SAKAI, J. Current Loop Coalescence Model of Solar Flares. T. Tajima, J. Sakai, H. Nakajima, T. Kosugi, F. Brunel, and M. R. Kundu. **321**, 1031, 135-F11 (1987)
- SAKAI, JUN-ICHI. Nonstochastic Prompt Proton Acceleration by Fast Magnetosonic Shocks in the Solar Plasma. Yukiharu Ohsawa and Jun-ichi Sakai. **313**, 440, 19-G4 (1987)
- SAKATA, AKIRA. Infrared Spectrum of Quenched Carbonaceous Composite (QCC). II. A New Identification of the 7.7 and 8.6 Micron Unidentified Infrared Emission Bands. Akira Sakata, Setsuko Wada, Takashi Onaka, and Alan T. Tokunaga. **320**, L63, 114-E9 (1987)
- SAKIMOTO, K. Para/Ortho Abundance Ratio of Molecular Hydrogen in NGC 2023. K. Takayanagi, K. Sakimoto, and K. Onda. **318**, L81, 92-E2 (1987)
- SALAMON, M. H. Elemental Technetium and Promethium as Cosmic-Ray Clocks. J. Drach and M. H. Salamon. **319**, 237, 95-E9 (1987)
- SALOTTI, L. A Deep Optical Study of the Field of 1E 0630 + 178. G. F. Bignami, P. A. Caraveo, J. A. Paul, L. Salotti, and L. Vigroux. **319**, 358, 97-A1 (1987)
- SALPETER, E. E. Deceleration of Infalling Plasma in the Atmospheres of Accreting Neutron Stars. I. Isothermal Atmospheres. G. S. Miller, E. E. Salpeter, and I. Wasserman. **314**, 215, 30-D13 (1987)
- Gasdynamical Stripping of Elliptical Galaxies. T. J. Gaetz, E. E. Salpeter, and G. Shaviv. **316**, 530, 57-G3 (1987)
- 1.4 GHz Continuum Sources in the Cancer Cluster. E. E. Salpeter and J. M. Dickey. **317**, 102, 65-B1 (1987)
- H I Detection Survey of a Complete Magnitude-limited Sample of Dwarf Irregular Galaxies in the Virgo Cluster Area. G. Lyle Hoffman, George Helou, E. E. Salpeter, John Glosson, and A. Sandage. **63**, 247, 4-A5 (1987) (Abstr. in **312**, 964, 13-E5)
- SALVATI, M. Optical and X-Ray Radiation from Fast Pulsars: Effects of Duty Cycle and Spectral Shape. F. Pacini and M. Salvati. **321**, 447, 127-A12 (1987)
- SAMPSON, DOUGLAS H. Collision Rates for Excitation of Helium-like Ions with Inclusion of Resonance Effects. Honglin Zhang and Douglas H. Sampson. **63**, 487, 8-D5 (1987) (Abstr. in **312**, 967, 13-E8)
- SANCISI, R. H I Gas near the Giant Elliptical Galaxy NGC 4472. R. Sancisi, N. Thonnard, and R. D. Ekers. **315**, L39, 45-D8 (1987)
- SANDAGE, A. H I Detection Survey of a Complete Magnitude-limited Sample of Dwarf Irregular Galaxies in the Virgo Cluster Area. G. Lyle Hoffman, George Helou, E. E. Salpeter, John Glosson, and A. Sandage. **63**, 247, 4-A5 (1987) (Abstr. in **312**, 964, 13-E5)
- SANDAGE, ALLAN. The Redshift-Distance Relation. IXa. Reinterpretation of the Local Group Deceleration Data Emphasizing the Kahn-Woltjer Mass Determination. Allan Sandage. **317**, 557, 72-C1 (1987)
- SANDERS, D. B. Detection of CO(1 \rightarrow 0) Emission and Optical Imaging of the Seyfert Galaxy/QSO Markarian 231. D. B. Sanders, J. S. Young, N. Z. Scoville, B. T. Soifer, and G. E. Danielson. **312**, L5, 7-A8 (1987)
- Compact Molecular Gas Structure in the Interacting Galaxy Pair Arp 299 (IC 694-NGC 3690). A. I. Sargent, D. B. Sanders, N. Z. Scoville, and B. T. Soifer. **312**, L35, 14-B1 (1987)
- Where Massive Stars Form: Associated Radio H II Regions and CO Clouds in the Northern Milky Way. W. H. Waller, D. P. Clemens, D. B. Sanders, and N. Z. Scoville. **314**, 397, 32-E4 (1987)
- The IRAS Bright Galaxy Sample. II. The Sample and Luminosity Function. B. T. Soifer, D. B. Sanders, B. F. Madore, G. Neugebauer, G. E. Danielson, J. H. Elias, Carol J. Lonsdale, and W. L. Rice. **320**, 238, 110-F7 (1987)
- OH Megamasers in High-Luminosity IRAS Galaxies. I. F. Mirabel and D. B. Sanders. **322**, 688, 147-C8 (1987)
- CO Emission from Centaurus A. T. G. Phillips, B. N. Ellison, J. B. Keene, R. B. Leighton, R. J. Howard, C. R. Masson, D. B. Sanders, B. Veidt, and K. Young. **322**, L73, 152-B8 (1987)
- Molecular Clouds and Cloud Cores in the Inner Galaxy. N. Z. Scoville, Min Su Yun, D. P. Clemens, D. B. Sanders, and W. H. Waller. **63**, 821, 13-G12 (1987) (Abstr. in **314**, 832, 38-F8)
- SANDULEAK, N. The Case Low-Dispersion Northern Sky Survey. IV. Galaxies in the Bootes Void Region. N. Sanduleak and Peter Pesch. **63**, 809, 13-F6 (1987) (Abstr. in **314**, 831, 38-F7)
- SANG, YEMING. Ohmic Decay of Crustal Neutron Star Magnetic Fields. Yeming Sang and G. Chamugam. **323**, L61, 158-E2 (1987)
- SANTOS, N. O. Nonadiabatic Gravitational Collapse. A. K. G. de Oliveira and N. O. Santos. **312**, 640, 10-A1 (1987)
- SARAZIN, CRAIG L. Narrow-Angle Tail Radio Sources and the Distribution of Galaxy Orbits in Abell Clusters. Christopher P. O'Dea, Craig L. Sarazin, and Frazer N. Owen. **316**, 113, 51-C1 (1987)
- Star Formation in X-Ray Cluster Cooling Flows. Raymond E. White III and Craig L. Sarazin. **318**, 612, 87-E9 (1987)
- Determining Star Formation Rates in X-Ray Cluster Cooling Flows. Raymond E. White III and Craig L. Sarazin. **318**, 621, 87-F5 (1987)
- Numerical Models of Star Formation in X-Ray Cluster Cooling Flows. Raymond E. White III and Craig L. Sarazin. **318**, 629, 87-F14 (1987)
- Steady State Cooling Flow Models for Normal Elliptical Galaxies. Craig L. Sarazin and Raymond E. White III. **320**, 32, 108-C11 (1987)
- SARGENT, A. I. Compact Molecular Gas Structure in the Interacting Galaxy Pair Arp 299 (IC 694-NGC 3690). A. I. Sargent, D. B. Sanders, N. Z. Scoville, and B. T. Soifer. **312**, L35, 14-B1 (1987)
- CO Maps of the OMC-1 Outflow. C. R. Masson, K. Y. Lo, T. G. Phillips, A. I. Sargent, N. Z. Scoville, and D. P. Woody. **319**, 446, 98-A11 (1987)
- A Possible Protostar near HH 7-11. E. N. Grossman, C. R. Masson, A. I. Sargent, N. Z. Scoville, S. Scott, and D. P. Woody. **320**, 356, 112-A1 (1987)
- SARGENT, ANNEILA I. Kinematics of the Circumstellar Gas of HL Tauri and R Monocerotis. Anneila I. Sargent and Steven Beckwith. **323**, 294, 156-C5 (1987)
- SARGENT, D. Magnetic Field Evolution in White Dwarfs. C. E. Wendell, H. M. Van Horn, and D. Sargent. **313**, 284, 18-A12 (1987)
- SARGENT, WALLACE L. W. The Effect of the Lyman-Alpha Forest on the Ultraviolet Continua of Very High Redshift Quasars. Charles C.

- Steidel and Wallace L. W. Sargent. **313**, 171, 16-G7 (1987)
- A New Upper Limit on the Density of Generally Distributed Inter-galactic Neutral Hydrogen. Charles C. Steidel and Wallace L. W. Sargent. **318**, L11, 85-A13 (1987)
- Absorption in the Wide QSO Pair Tololo 1037 - 2704 and Tololo 1038 - 2712: Evidence for a Specially Aligned Supercluster at $z = 2$? Wallace L. W. Sargent and Charles C. Steidel. **322**, 142, 139-D11 (1987)
- High-Resolution Spectra of 24 Low-Redshift QSOs: The Properties of Mg II Absorption Systems. David Tytler, A. Boksenberg, Wallace L. W. Sargent, Peter Young, and Daniel Kunth. **64**, 667, 27-B8 (1987) (Abstr. in **318**, 945, 91-C10)
- SASAKI, MISAU. Small-scale Anisotropies in the Microwave Background in a Baryon-dominated Open Universe. Naoteru Gouda, Misaou Sasaki, and Yasushi Suto. **321**, L1, 129-B4 (1987)
- SASLAW, WILLIAM C. New Limits to Bias and the Amount of Dark Matter in the Universe. William C. Saslaw, H. M. Antia, and S. M. Chitre. **315**, L1, 45-A4 (1987)
- SAVAGE, BLAIR D. Highly Ionized Interstellar Gas Located in the Galactic Disk and Halo. Blair D. Savage and Derck Massa. **314**, 380, 32-C11 (1987)
- SAYKALLY, R. J. Laboratory Measurement of the Pure Rotational Spectrum of Vibrationally Excited HCO^+ ($v = 1$) by Far-Infrared Laser Sideband Spectroscopy. Geoffrey A. Blake, K. B. Laughlin, R. C. Cohen, Kerry L. Busarow, and R. J. Saykally. **316**, L45, 56-D7 (1987)
- SCALO, JOHN M. Continuum Models for Gas in Disturbed Galaxies. III. Bifurcations and Chaos in a Deterministic Model for Bursts of Star Formation. Curtis Struck-Marcell and John M. Scalo. **64**, 39, 17-D11 (1987) (Abstr. in **315**, 730, 48-E11)
- SCARROTT, S. M. Polarimetry of the NGC 2261/R Monocerotis System and the Faint Jetlike Feature to its Southwest. R. F. Warren-Smith, P. W. Draper, and S. M. Scarrott. **315**, 500, 46-B11 (1987)
- SCATENA-WACHEL, DEBRA E. Large Negative ^{50}Ti Anomalies in Refractory Inclusions from the Murchison Carbonaceous Chondrite: Evidence for Incomplete Mixing of Neutron-rich Supernova Ejecta into the Solar System. Richard W. Hinton, Andrew M. Davis, and Debra E. Scatena-Wachel. **313**, 420, 19-E12 (1987)
- SCHADE, D. The M31 Globular Cluster System: Erratum. D. Crampton, A. P. Cowley, D. Schade, and P. Chayer. **322**, 1074, 151-F12 (1987) (Orig. paper in **288**, 494, 8-B2)
- SCHADE, DAVID. The Late-Type Stellar Content of NGC 55. Christopher J. Pritchett, Harvey B. Richer, David Schade, Dennis Crabtree, and H. K. C. Yee. **323**, 79, 154-A3 (1987)
- SCHAEFFER, BRADLEY E. Gamma-Ray Burster Counterparts: Infrared. Bradley E. Schaefer, T. L. Cline, U. Desai, B. J. Teegarden, J.-L. Atteia, C. Barot, K. Hurley, M. Niel, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, I. V. Estulin, and A. V. Kuznetsov. **313**, 226, 17-D9 (1987)
- The Perseus Flasher and Satellite Glints. Bradley E. Schaefer, Michael Barber, John J. Brooks, Allen DeForrest, Paul D. Maley, Norman W. McLeod III, Russ McNeil, Andrew J. Noymer, A. K. Presnell, Richard Schwartz, and Scott Whitney. **320**, 398, 112-D2 (1987)
- Light Echoes: Supernovae 1987A and 1986G. Bradley E. Schaefer. **323**, L47, 158-D3 (1987)
- Light Echoes: Type II Supernovae. Bradley E. Schaefer. **323**, L51, 158-D6 (1987)
- SCHAEFFER, R. Light Curves of Exploding Wolf-Rayet Stars. R. Schaeffer, M. Cassé, and S. Cahen. **316**, L31, 56-C8 (1987)
- SCHALINSKI, C. 1928 + 738: A Superluminal Source with Large-Scale Structure. K. J. Johnston, R. S. Simon, A. Eckart, P. Biermann, C. Schalinski, A. Witzel, and R. G. Strom. **313**, L85, 27-D11 (1987)
- SCHECHTER, PAUL L. H I Maps of 50 Galaxies with Polar Rings. J. H. van Gorkom, Paul L. Schechter, and Jerome Kristian. **314**, 457, 34-E3 (1987)
- A Survey of the Bootes Void. Robert P. Kirshner, Augustus Oemler, Jr., Paul L. Schechter, and Stephen A. Shectman. **314**, 493, 35-A2 (1987)
- SCHEINGRABER, H. Deterministic Chaos in Accreting Systems: Analysis of the X-Ray Variability of Hercules X-1. W. Voges, H. Atmanspacher, and H. Scheingraber. **320**, 794, 118-D10 (1987)
- SCHERRER, P. H. Rotation of the Coronal Magnetic Fields. J. T. Hoeksema and P. H. Scherrer. **318**, 428, 83-E12 (1987)
- SCHERRER, ROBERT J. Large-Scale Structure from Cosmic String Loops. I. Formation and Linear Evolution of Perturbations. Robert J. Scherrer. **320**, 1, 108-A7 (1987)
- SCHUEFLE, B. M. The Interstellar Clouds toward 3C 154 and 3C 353. S. R. Federman, Neal J. Evans II, R. F. Willson, E. Falgarone, F. Combes, and B. M. Schueftele. **322**, 960, 150-D4 (1987)
- SCHIANO, A. V. R. The Effect of a Quasi-stellar Object on Its Host Galaxy: Dynamical and Physical Processes in the Interstellar Medium around a Quasi-stellar Object. C. A. Chang, A. V. R. Schiano, and A. M. Wolfe. **322**, 180, 139-G8 (1987)
- SCHILD, R. E. 1E 0116.3 - 0116: A Peculiar, X-Ray-Bright, Early-Type Galaxy. D. Maccagni, I. M. Gioia, T. Maccacaro, R. E. Schild, and J. T. Stocke. **316**, 132, 51-D6 (1987)
- Near-Infrared and Optical Observations of IRAS Sources in and near Dense Cores. P. C. Myers, Gary A. Fuller, R. D. Mathieu, C. A. Beichman, P. J. Benson, R. E. Schild, and J. P. Emerson. **319**, 340, 96-F5 (1987)
- X-Ray and Optical Observations of X-Ray-Selected BL Lacertae Objects. P. Giommi, P. Barr, B. Garilli, I. M. Gioia, T. Maccacaro, D. Maccagni, and R. E. Schild. **322**, 662, 146-A10 (1987)
- SCHILD, RUDOLPH E. X-Ray-Selected AGNs near Bright Galaxies. John T. Stocke, Peter Schneider, Simon L. Morris, Isabella M. Gioia, Tommaso Maccacaro, and Rudolph E. Schild. **315**, L11, 45-A14 (1987)
- SCHILIZZI, RICHARD T. The Inner Beams of SS 433. Jonathan D. Romney, Richard T. Schilizzi, István Fejes, and Ralph E. Spencer. **321**, 822, 133-E3 (1987)
- SCHINDER, PAUL J. Neutrino Emission by the Pair, Plasma, and Photo Processes in the Weinberg-Salam Model. Paul J. Schinder, David N. Schramm, Paul J. Wiita, Steven H. Margolis, and David L. Tubbs. **313**, 531, 22-E9 (1987)
- SCHLEGEL, ERIC M. Time-resolved Spectrophotometry of the Cataclysmic Variable EX Hydrae. Ronald H. Kaitchuck, Panayiotis A. Hantzios, Panagiotis Kakaletis, R. Kent Honeycutt, and Eric M. Schlegel. **317**, 765, 74-D3 (1987)
- Atlas of Time-resolved Spectrophotometry of Cataclysmic Variables. R. Kent Honeycutt, Ronald H. Kaitchuck, and Eric M. Schlegel. **65**, 451, 34-D4 (1987) (Abstr. in **321**, 1052, 136-A3)
- SCHLICKEISER, R. Smearing of a Beaming Pattern by an Isotropic Cloud: An Analysis with Applications to Nonpulsing X-Ray Sources and Cosmic Rays. Y.-M. Wang and R. Schlickeiser. **313**, 200, 17-B11 (1987)
- SCHLOERB, F. P. High-Resolution Images of the L1551 Bipolar Outflow: Evidence for an Expanding, Accelerated Shell. G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, F. P. Schloerb, K. M. Strom, and G. L. Grasdale. **319**, 742, 103-B6 (1987)
- The Magnetic Evolution of the Taurus Molecular Clouds. I. Large-scale Properties. Mark H. Heyer, Frederick J. Vrba, Ronald L. Snell, F. P. Schloerb, Stephen E. Strom, Paul F. Goldsmith, and Karen M. Strom. **321**, 855, 133-G9 (1987)
- SCHLOERB, F. PETER. 1300 Micron Continuum and C^{18}O Line Mapping of the Giant Molecular Cloud Cores in Orion, W49, and W51. F. Peter Schloerb, Ronald L. Snell, and P. R. Schwartz. **319**, 426, 97-G5 (1987)
- SCHMAHL, E. J. Simultaneous VLA Observations of a Flare at 6 and 20 Centimeter Wavelengths. T. Velusamy, M. R. Kundu, E. J. Schmah, and M. McCabe. **319**, 984, 105-F4 (1987)
- SCHMELZ, J. T. The Leo Triplet Spiral Galaxy NGC 3628. I. VLA Observations of the Neutral Hydrogen Absorption. J. T. Schmelz, W. A. Baan, and A. D. Haschick. **315**, 492, 46-B3 (1987)
- The Leo Triplet Spiral Galaxy NGC 3628. II. VLA Observations of the Hydroxyl Absorption. J. T. Schmelz, W. A. Baan, and A. D. Haschick. **320**, 145, 109-E11 (1987)
- The Megamaser Galaxy Markarian 273. I. VLA Observations of the Hydroxyl Emission. J. T. Schmelz, W. A. Baan, and A. D. Haschick. **321**, 225, 124-F6 (1987)
- SCHMELZ, JOAN T. The Peculiar Galaxy IC 4553. II. VLA Observations of the Neutral Hydrogen. Willem A. Baan, J. H. van Gorkom, Joan T. Schmelz, and J. Felix Mirabel. **313**, 102, 16-B7 (1987)
- SCHMIDT, GARY D. The Hiss of BL Lacertae. Richard L. Moore, Gary D. Schmidt, and Steven C. West. **314**, 176, 29-G10 (1987)
- 1E 1048.5 + 5421: A New 114 Minute AM Herculis Binary. Simon L. Morris, Gary D. Schmidt, James Liebert, John Stocke, Isabella M. Gioia, and Tommaso Maccacaro. **314**, 641, 36-E8 (1987)
- The Rotationally Modulated Zeeman Spectrum at Nearly 10^9 Gauss of the White Dwarf PG 1031 + 234. William B. Latter, Gary D. Schmidt, and Richard F. Green. **320**, 308, 111-D9 (1987)
- The Discovery of Near-Infrared Polarized Cyclotron Emission in the Intermediate Polar BG Canis Minoris. Steven C. West, Graham Berriman, and Gary D. Schmidt. **322**, L35, 145-C7 (1987)
- SCHMIDT, M. The Triple Radio Source 0023 + 171: A Candidate for a Dark Gravitational Lens. J. N. Hewitt, E. L. Turner, C. R. Lawrence, D. P. Schneider, J. E. Gunn, C. L. Bennett, B. F. Burke, J. H. Mahoney, G. I. Langston, M. Schmidt, J. B. Oke, and J. G. Hoessel. **321**, 706, 132-C5 (1987)
- Continuum Energy Distributions of Quasars in the Palomar-Green Survey. G. Neugebauer, R. F. Green, K. Matthews, M. Schmidt, B. T. Soifer, and J. Bennett. **63**, 615, 10-A7 (1987) (Abstr. in **313**, 929, 26-G12)
- SCHMIDT, MAARTEN. Nine Optically Selected Quasars with Redshifts Larger Than 3. Maarten Schmidt, Donald P. Schneider, and James E.

- Gunn. **316**, L1, 56-A4 (1987)
 PC 0910 + 5625: An Optically Selected Quasar with a Redshift of 4.04. *Maarten Schmidt, Donald P. Schneider, and James E. Gunn.* **321**, L7, 129-B10 (1987)
- SCHMIDTKE, PAUL C. CAL 83: A Puzzling X-Ray Source in the Large Magellanic Cloud. *David Crampton, A. P. Cowley, J. B. Hutchings, Paul C. Schmidtke, I. B. Thompson, and James Liebert.* **321**, 745, 132-F3 (1987)
- SCHMIEDER, B. Evidence for Gentle Chromospheric Evaporation during the Gradual Phase of Large Solar Flares. *B. Schmieder, T. G. Forbes, J. M. Malherbe, and M. E. Machado.* **317**, 956, 76-E8 (1987)
- SCHMITT, J. H. M. X-Ray Observations of Solar Flares with the Einstein Observatory. *J. H. M. M. Schmitt, F. R. Harnden, Jr., and H. Fink.* **322**, 1023, 151-B6 (1987)
- SCHNACK, D. D. Nonlinear Radiative Condensation in a Sheared Magnetic Field. *G. Van Hoven, L. Sparks, and D. D. Schnack.* **317**, L91, 78-D9 (1987)
- SCHNEIDER, D. P. The Triple Radio Source 0023 + 171: A Candidate for a Dark Gravitational Lens. *J. N. Hewitt, E. L. Turner, C. R. Lawrence, D. P. Schneider, J. E. Gunn, C. L. Bennett, B. F. Burke, J. H. Mahoney, G. I. Langston, M. Schmidt, J. B. Oke, and J. G. Hoessel.* **321**, 706, 132-C5 (1987)
- SCHNEIDER, DONALD P. Nine Optically Selected Quasars with Redshifts Larger Than 3. *Maarten Schmidt, Donald P. Schneider, and James E. Gunn.* **316**, L1, 56-A4 (1987)
 PC 0910 + 5625: An Optically Selected Quasar with a Redshift of 4.04. *Maarten Schmidt, Donald P. Schneider, and James E. Gunn.* **321**, L7, 129-B10 (1987)
- SCHNEIDER, P. Amplification and Polarization of Supernovae by Gravitational Lensing. *P. Schneider and Robert V. Wagoner.* **314**, 154, 29-F2 (1987)
 On the Acceleration of Charged Particles at Relativistic Shock Fronts. *J. G. Kirk and P. Schneider.* **315**, 425, 45-D1 (1987)
 An Analytically Soluble Problem in Fully Nonlinear Statistical Gravitational Lensing. *P. Schneider.* **319**, 9, 93-B1 (1987)
 Particle Acceleration at Shocks: A Monte Carlo Method. *J. G. Kirk and P. Schneider.* **322**, 256, 140-F2 (1987)
- SCHNEIDER, PETER. X-Ray-Selected AGNs near Bright Galaxies. *John T. Stocke, Peter Schneider, Simon L. Morris, Isabella M. Gioia, Tommaso Maccacaro, and Rudolph E. Schild.* **315**, L11, 45-A14 (1987)
 The Amplification Bias by Gravitational Lensing on Observed Number Counts of Quasars: Effects of a Finite Source Size. *Peter Schneider.* **316**, L7, 56-A10 (1987)
 Electron Injection by Relativistic Protons in Active Galactic Nuclei. *Marek Sikora, John G. Kirk, Mitchell C. Begelman, and Peter Schneider.* **320**, L81, 121-B1 (1987)
 Fermi Acceleration at Shocks with Arbitrary Velocity Profiles. *Peter Schneider and John G. Kirk.* **323**, L87, 158-G1 (1987)
- SCHNEIDER, STEPHEN E. Atomic Hydrogen in Planetary Nebulae. *Stephen E. Schneider, Peter R. Silbergate, Daniel R. Altschuler, and Carlo Giovanardi.* **314**, 572, 35-G1 (1987)
 The Spatial Distribution of Dwarf Galaxies in the CfA Slice of the Universe. *Trinh X. Thuan, J. Richard Gott III, and Stephen E. Schneider.* **315**, L93, 49-C2 (1987)
- SCHNOPPER, H. W. X-Ray Observations of the Supernova Remnant N103B in the Large Magellanic Cloud. *K. P. Singh, N. J. Westergaard, H. W. Schnopper, and D. J. Helfand.* **322**, 80, 138-G3 (1987)
- SCHOMBERT, JAMES M. The Structure of Brightest Cluster Members. II. Mergers. *James M. Schombert.* **64**, 643, 26-G2 (1987) (Abstr. in **318**, 945, 91-C10)
- SCHOMMER, R. A. The H I Distribution and Kinematics in Four Low-Luminosity Elliptical Galaxies. *George Lake, R. A. Schommer, and J. H. van Gorkom.* **314**, 57, 28-E12 (1987)
 Forbidden [O II] and [O III] Emission 29'' from a QSO Absorption-Line Region. *Brian Yanny, Don Hamilton, R. A. Schommer, T. B. Williams, and D. G. York.* **323**, L19, 158-B7 (1987)
- SCHÖNFELDER, V. Centaurus A Observation at MeV- Gamma-Ray Energies. *P. von Ballmoos, R. Diehl, and V. Schönfelder.* **312**, 134, 2-D11 (1987)
 Map of the Galactic Center Region in the 1.8 MeV ^{26}Al Gamma-Ray Line. *P. von Ballmoos, R. Diehl, and V. Schönfelder.* **318**, 654, 88-B1 (1987)
- SCHRAMM, D. N. Resonant Neutrino Oscillations and Stellar Collapse. *G. M. Fuller, R. W. Mayle, J. R. Wilson, and D. N. Schramm.* **322**, 795, 148-E3 (1987)
- SCHRAMM, DAVID N. Neutrino Emission by the Pair, Plasma, and Photo Processes in the Weinberg-Salam Model. *Paul J. Schinder, David N. Schramm, Paul J. Wiita, Steven H. Margolis, and David L. Tubbs.* **313**, 531, 22-E9 (1987)
 Neutrinos from Gravitational Collapse. *Ron Mayle, James R. Wilson, and David N. Schramm.* **318**, 288, 82-A11 (1987)
- SCHREIER, E. J. X-Rays from the Radio Halo of M87. *E. D. Feigelson, P. A. D. Wood, E. J. Schreier, D. E. Harris, and M. J. Reid.* **312**, 101, 2-B5 (1987)
- SCHULTZ, J. see SVOBODA, R. et al.
- SCHWARTZ, D. A. Discovery of Three New RS Canum Venaticorum-like Counterparts to HEAO 1 X-Ray Sources. *D. A. H. Buckley, I. R. Tuohy, R. A. Remillard, H. V. Bradt, and D. A. Schwartz.* **315**, 273, 42-G14 (1987)
- SCHWARTZ, DANIEL A. Use of a Minimum Rate of Change Formalism to Quantify Variability of Extragalactic X-Ray Sources. *Daniel A. Schwartz.* **318**, 568, 87-B7 (1987)
- SCHWARTZ, P. R. Infrared Line Observations of Low-Luminosity Outflow Sources. *Howard A. Smith, J. Fischer, T. R. Geballe, and P. R. Schwartz.* **316**, 265, 52-G12 (1987)
 1300 Micron Continuum and C ^{18}O Line Mapping of the Giant Molecular Cloud Cores in Orion, W49, and W51. *F. Peter Schloerb, Ronald L. Snell, and P. R. Schwartz.* **319**, 426, 97-G5 (1987)
 Star-forming Loops in the IRAS Sky Images. *P. R. Schwartz.* **320**, 258, 111-A1 (1987)
- SCHWARTZ, R. A. High Spectral Resolution Measurements of a Solar Flare Hard X-Ray Burst. *R. P. Lin and R. A. Schwartz.* **312**, 462, 6-A1 (1987)
 Gamma-Ray Burst Localization by HEAO 3. *R. A. Schwartz, J. C. Ling, W. A. Mahoney, and A. S. Jacobson.* **317**, 846, 75-C7 (1987)
- SCHWARTZ, RICHARD. The Perseus Flasher and Satellite Glints. *Bradley E. Schaefer, Michael Barber, John J. Brooks, Allen DeForrest, Paul D. Malley, Norman W. McLeod III, Russ McNiel, Andrew J. Noymer, A. K. Presnell, Richard Schwartz, and Scott Whitney.* **320**, 398, 112-D2 (1987)
- SCHWARTZ, RICHARD D. IRAS Observations of the Exciting Stars of Herbig-Haro Objects. *Martin Cohen and Richard D. Schwartz.* **316**, 311, 53-D3 (1987)
 Near-Infrared H $_2$ Emission from Herbig-Haro Objects. I. A Survey of Low-Excitation Objects. *Richard D. Schwartz, Martin Cohen, and Peredur M. Williams.* **322**, 403, 142-C2 (1987)
- SCHWARZSCHILD, M. Nonuniqueness of Self-consistent Equilibrium Solutions for the Perfect Elliptic Disk. *P. T. de Zeeuw, C. Hunter, and M. Schwarzschild.* **317**, 607, 72-F11 (1987)
- SCHWEIZER, FRANÇOIS. The Shape of the Dark Halo in Polar-Ring Galaxies. *Bradley C. Whitmore, Douglas B. McElroy, and François Schweizer.* **314**, 439, 34-C9 (1987)
 The Structure and Evolution of Hoag's Object. *François Schweizer, W. Kent Ford, Jr., Robert Jedrzejewski, and Riccardo Giovanelli.* **320**, 454, 114-D3 (1987)
- SCHWEIZER, LINDA Y. Mass-to-Light Ratios of Binary Galaxies. I. Radial Velocities. *Linda Y. Schweizer.* **64**, 411, 22-D3 (1987) (Abstr. in **316**, 859, 61-E1)
 Mass-to-Light Ratios of Binary Galaxies. II. Photoelectric BV Photometry. *Linda Y. Schweizer.* **64**, 417, 22-D9 (1987) (Abstr. in **316**, 860, 61-E2)
 Mass-to-Light Ratios of Binary Galaxies. III. Analysis. *Linda Y. Schweizer.* **64**, 427, 22-E4 (1987) (Abstr. in **316**, 860, 61-E2)
- SCIORTINO, S. Variability Analysis in Low Count Rate Sources. *A. Collura, A. Maggio, S. Sciortino, S. Serio, G. S. Vaiana, and R. Rosner.* **315**, 340, 43-E11 (1987)
 Einstein Observatory Survey of X-Ray Emission from Solar-Type Stars: The Late F and G Dwarf Stars. *A. Maggio, S. Sciortino, G. S. Vaiana, P. Majer, J. Bookbinder, L. Golub, F. R. Harnden, Jr., and R. Rosner.* **315**, 687, 48-B8 (1987)
- SCIORTINO, SALVATORE. Rapid, Low-Level X-Ray Variability in Active Late-Type Dwarfs. *Carol W. Ambruster, Salvatore Sciortino, and L. Golub.* **65**, 273, 32-B4 (1987) (Abstr. in **319**, 1012, 106-A10)
- SCOTT, H. A. The Origin of the Photoionizing Continuum of Active Galactic Nuclei and Quasars. *S. L. O'Dell, H. A. Scott, and W. A. Stein.* **313**, 164, 16-F14 (1987)
- SCOTT, S. Molecular Spiral Structure in M51. *K. Y. Lo, R. Ball, C. R. Masson, T. G. Phillips, S. Scott, and D. P. Woody.* **317**, L63, 78-B11 (1987)
 A Possible Protostar near HH 7-11. *E. N. Grossman, C. R. Masson, A. I. Sargent, N. Z. Scoville, S. Scott, and D. P. Woody.* **320**, 356, 112-A1 (1987)
- SCOTT, S. L. Molecular Gas in the Starburst Nucleus of M82. *K. Y. Lo, K. W. Cheung, C. R. Masson, T. G. Phillips, S. L. Scott, and D. P. Woody.* **312**, 574, 9-B7 (1987)
- SCOVILLE, N. Z. Detection of CO(1 \rightarrow 0) Emission and Optical Imaging of the Seyfert Galaxy/QSO Markarian 231. *D. B. Sanders, J. S. Young, N. Z. Scoville, B. T. Soifer, and G. E. Danielson.* **312**, L5, 7-A8 (1987)
 Compact Molecular Gas Structure in the Interacting Galaxy Pair Arp 299 (IC 694-NGC 3690). *A. I. Sargent, D. B. Sanders, N. Z. Scoville, and B. T. Soifer.* **312**, L35, 14-B1 (1987)

- The Molecular Cloud Ring in NGC 1068. *Steven T. Myers and N. Z. Scoville*. **312**, L39, 14-B6 (1987)
- Where Massive Stars Form: Associated Radio H II Regions and CO Clouds in the Northern Milky Way. *W. H. Waller, D. P. Clemens, D. B. Sanders, and N. Z. Scoville*. **314**, 397, 32-E4 (1987)
- Molecular Clouds and the Gould Belt. *David K. Taylor, R. L. Dickman, and N. Z. Scoville*. **315**, 104, 41-B2 (1987)
- Radial Velocities of Late-Type Stars in the Galactic Center. *K. Seligren, D. N. B. Hall, S. G. Kleinmann, and N. Z. Scoville*. **317**, 881, 75-F5 (1987)
- CO Maps of the OMC-1 Outflow. *C. R. Masson, K. Y. Lo, T. G. Phillips, A. I. Sargent, N. Z. Scoville, and D. P. Woody*. **319**, 446, 98-A11 (1987)
- A Possible Protostar near HH 7-11. *E. N. Grossman, C. R. Masson, A. I. Sargent, N. Z. Scoville, S. Scott, and D. P. Woody*. **320**, 356, 112-A1 (1987)
- Molecular Clouds and Cloud Cores in the Inner Galaxy. *N. Z. Scoville, Min Su Yun, D. P. Clemens, D. B. Sanders, and W. H. Waller*. **63**, 821, 13-G12 (1987) (Abstr. in **314**, 832, 38-F8)
- SCOVILLE, NICK. Infrared Characteristics of the Nuclei of Normal Galaxies. *Nicholas A. Devereux, E. E. Becklin, and Nick Scoville*. **312**, 529, 8-F3 (1987)
- SEAB, C. G. Shock Processing of Interstellar Dust: Diamonds in the Sky. *A. G. G. M. Tielens, C. G. Seab, D. J. Hollenbach, and Christopher F. McKee*. **319**, L109, 107-G6 (1987)
- SEAB, C. GREGORY. The Structure of Time-dependent Interstellar Shocks and Grain Destruction in the Interstellar Medium. *Christopher F. McKee, David J. Hollenbach, C. Gregory Seab, and A. G. G. M. Tielens*. **318**, 674, 88-C7 (1987)
- SEAQUIST, E. R. A Detailed Analysis of the Radio Emission from the Symbiotic Star RX Puppis. *E. R. Seaquist and A. R. Taylor*. **312**, 813, 11-G1 (1987)
- Evidence for Ram Pressure Stripping of NGC 3073 by Outflowing Gas from NGC 3079. *Judith A. Irwin, E. R. Seaquist, A. R. Taylor, and N. Duric*. **313**, L91, 27-E3 (1987)
- A Radio Survey of Symbiotic Stars: Erratum. *E. R. Seaquist, A. R. Taylor, and S. Sutton*. **317**, 555, 70-A5 (1987) (Orig. paper in **284**, 202, 100-C7)
- SEELY, J. F. Observation of Nonthermal Energy Distributions during the Impulsive Phase of Solar Flares. *J. F. Seely, U. Feldman, and G. A. Doschek*. **319**, 541, 99-B9 (1987)
- SEGAL, I. E. Resolution of the Discrepancy between the X-Ray Background Spectrum and That of Discrete Sources. *I. E. Segal*. **313**, 543, 22-F7 (1987)
- The Paucity of High-Redshift Quasars and Comparative Cosmology. *I. E. Segal*. **316**, L5, 56-A8 (1987)
- Correction of a Study of Source Counts in the Chronometric Cosmology. *I. E. Segal*. **320**, 135, 109-E1 (1987)
- SEGGEWISS, WILHELM. The Wolf-Rayet Population in 30 Doradus and Its Surroundings. *Anthony F. J. Moffat, Virpi S. Niemela, M. M. Phillips, You-hua Chu, and Wilhelm Seggewiss*. **312**, 612, 9-E7 (1987)
- An Eight-Year Spectroscopic Orbit for the WC7 + O4 Wolf-Rayet Binary HD 193793: Toward Solving the Mystery of the Infrared Outbursts. *Anthony F. Moffat, Robert Lamontagne, Peredur M. Williams, Jiri Horn, and Wilhelm Seggewiss*. **312**, 807, 11-F8 (1987)
- SEIDEL, E. Intermediate-Age Core Helium Burning Stars and the Distance to the Magellanic Clouds. *E. Seidel, G. S. Da Costa, and Pierre Demarque*. **313**, 192, 17-B1 (1987)
- The Evolution of Red Clump Stars: Theoretical Sequences. *E. Seidel, P. Demarque, and D. Weinberg*. **63**, 917, 15-B13 (1987) (Abstr. in **314**, 832, 38-F8)
- SEIDEL, S. see SVOBODA, R. et al.
- SEKI, MIDORI. Neutrino-Pair Bremsstrahlung in Dense Stars. IV. Phonon Contributions in the Crystalline Lattice Phase: Erratum. *Naoki Itoh, Yasuharu Kohyama, Noriyoshi Matsumoto, and Midori Seki*. **322**, 584, 144-C9 (1987) (Orig. paper in **285**, 304, 113-C2)
- SEKIGUCHI, KAZUHIRO. IRAS Observations of Starburst and Nonactive Spiral Galaxies. *Kazuhiro Sekiguchi*. **316**, 145, 51-E6 (1987)
- SELLGREN, K. IRAS Surface Brightness Maps of Reflection Nebulae in the Pleiades. *Michael W. Castellet, K. Sellgren, and M. W. Werner*. **313**, 853, 26-B1 (1987)
- Radial Velocities of Late-Type Stars in the Galactic Center. *K. Seligren, D. N. B. Hall, S. G. Kleinmann, and N. Z. Scoville*. **317**, 881, 75-F5 (1987)
- SERIO, S. Hydrodynamic Flare Modeling: Comparison of Numerical Calculations with SMM Observations of the 1980 November 12 17:00 UT Flare. *G. Peres, F. Reale, S. Serio, and R. Pallavicini*. **312**, 895, 12-F5 (1987)
- Variability Analysis in Low Count Rate Sources. *A. Collura, A. Maggio, S. Sciortino, S. Serio, G. S. Vaiana, and R. Rosner*. **315**, 340, 43-E11 (1987)
- Simulations of the Ca XIX Spectral Emission from a Flaring Solar Coronal Loop. I. Thermal Case. *E. Antonucci, M. A. Doderio, G. Peres, S. Serio, and R. Rosner*. **322**, 522, 143-F1 (1987)
- SHAFFER, DAVID B. Multiphase VLB I Observations of 4C 39.25: Superluminal Motion and Stationary Structure. *David B. Shaffer, Alan P. Marscher, Jon Marcaide, and Jonathan D. Romney*. **314**, L1, 33-B4 (1987)
- Multifrequency VLBI Observations of 4C 39.25: A Superluminal Source without a Well-defined Core. *Alan P. Marscher, David B. Shaffer, Roy S. Booth, and Barry J. Geldzahler*. **319**, L69, 107-D7 (1987)
- SHAFTER, ALLEN W. Detection of Superhumps and Quasi-periodic Oscillations in the Light Curve of the Dwarf Nova SW Ursae Majoris. *Edward L. Robinson, Allen W. Shafter, J. Allen Hill, Matt A. Wood, and Janet A. Mattei*. **313**, 772, 25-C2 (1987)
- The Spatial Distribution and Population of Novae in M31. *Robin Ciardullo, Holland C. Ford, James D. Neill, George H. Jacoby, and Allen W. Shafter*. **318**, 520, 86-E6 (1987)
- An Upper Limit to the Space Density of Short-period Noninteracting Binary White Dwarfs. *Edward L. Robinson and Allen W. Shafter*. **322**, 296, 141-B1 (1987)
- SHAKOVSKAYA, N. I. X-Ray Sources in Regions of Star Formation. II. The Pre-Main-Sequence G Star HDE 283572. *F. M. Walter, A. Brown, J. L. Linsky, A. E. Rydgren, F. Vrba, M. Roth, L. Carrasco, P. F. Chugainov, N. I. Shakovskaya, and C. L. Imhoff*. **314**, 297, 31-D2 (1987)
- SHAPIRO, I. I. VLBI Observations of 23 Hot Spots in the Starburst Galaxy M82. *N. Bartel, M. I. Rainer, A. E. E. Rogers, I. I. Shapiro, R. J. Bonometti, N. L. Cohen, M. V. Gorenstein, J. M. Marcaide, and R. A. Preston*. **323**, 505, 160-B3 (1987)
- SHAPIRO, PAUL R. Hydrogen Molecules and the Radiative Cooling of Pregalactic Shocks. *Paul R. Shapiro and Hyesung Kang*. **318**, 32, 79-C8 (1987)
- Cosmological H II Regions and the Photoionization of the Intergalactic Medium. *Paul R. Shapiro and Mark L. Giroux*. **321**, L107, 137-A13 (1987)
- SHAPIRO, STUART L. The Dynamical Fate of Wide Binaries in the Solar Neighborhood. *Martin D. Weinberg, Stuart L. Shapiro, and Ira Wasserman*. **312**, 367, 4-G9 (1987)
- Simulations of Axisymmetric, Newtonian Star Clusters: Prelude to 2 + 1 General Relativistic Computations. *Stuart L. Shapiro and Saul A. Teukolsky*. **318**, 542, 86-G1 (1987)
- How Big Are Supermassive Black Holes Formed from the Collapse of Dense Star Clusters? *Christopher S. Kochanek, Stuart L. Shapiro, and Saul A. Teukolsky*. **320**, 73, 108-G8 (1987)
- The Collapse of Dense Star Clusters to Supermassive Black Holes: Binaries and Gravitational Radiation. *Gerald D. Quinlan and Stuart L. Shapiro*. **321**, 199, 124-D2 (1987)
- Globular Cluster Evolution in the Galaxy: A Global View. *David F. Chernoff and Stuart L. Shapiro*. **322**, 113, 139-B9 (1987)
- SHARA, MICHAEL M. The Discovery of Six New Short-Period Variables in the Old Open Cluster NGC 188. *Janusz Kaluzny and Michael M. Shara*. **314**, 585, 36-A2 (1987)
- Massive Disk Formation from the Collision of a Main-Sequence Star with a White Dwarf in a Globular Cluster Core. *Noam Soker, Oded Regev, Mario Livio, and Michael M. Shara*. **318**, 760, 89-C4 (1987)
- Binary System Parameters and the Hibernation Models of Cataclysmic Variables. *Mario Livio and Michael M. Shara*. **319**, 819, 104-A4 (1987)
- Wolf-Rayet Stars in the Andromeda Galaxy. *Anthony F. J. Moffat and Michael M. Shara*. **320**, 266, 111-A9 (1987)
- SHARE, G. Solar Neutron Emissivity During the Large Flare on 1982 June 3. *E. L. Chupp, H. Debrunner, E. Flückiger, D. J. Forrest, F. Golitz, G. Kanbach, W. T. Vestrand, J. Cooper, and G. Share*. **318**, 913, 91-A1 (1987)
- SHARE, G. H. The Directivity of High-Energy Emission from Solar Flares. II. *Solar Maximum Mission* Observations. *W. Thomas Vestrand, D. J. Forrest, E. L. Chupp, E. Rieger, and G. H. Share*. **322**, 1010, 151-A7 (1987)
- SHARP, C. M. Polyoxymethylene in Comet Halley. *W. F. Huebner, D. C. Boice, and C. M. Sharp*. **320**, L149, 121-F7 (1987)
- SHAVIV, G. Gasdynamical Stripping of Elliptical Galaxies. *T. J. Gaetz, E. E. Salpeter, and G. Shaviv*. **316**, 530, 57-G3 (1987)
- SHAVIV, GIORA. The Effect of Heating from the Boundary Layer on Accretion Models for Novae and Other Compact Objects. *Giora Shaviv and Sumner Starrfield*. **321**, L51, 129-F3 (1987)
- Evolution of a 0.7 M_{\odot} Red Giant. *Amos Harpaz, Attay Kovetz, and Giora Shaviv*. **323**, 154, 154-F13 (1987)
- SHAWL, STEPHEN J. Axial Ratios and Orientations for 100 Galactic Globular Star Clusters. *Raymond E. White and Stephen J. Shawl*. **317**, 246, 66-E13 (1987)

- SHAYA, E. J. The H I Distribution in Clouds within Galaxies. *E. J. Shaya and S. R. Federman*. **319**, 76, 93-G9 (1987)
- SHECTMAN, STEPHEN A. A Survey of the Bootes Void. *Robert P. Kirshner, Augustus Oemler, Jr., Paul L. Schechter, and Stephen A. Shectman*. **314**, 493, 35-A2 (1987)
- SHEELEY, N. R., JR. The Origin of Rigidly Rotating Magnetic Field Patterns on the Sun. *N. R. Sheeley, Jr., A. G. Nash, and Y.-M. Wang*. **319**, 481, 98-D5 (1987)
- SHEMANSKY, D. E. Electron Impact Excitation of H₂: Rydberg Band Systems and the Benchmark Dissociative Cross Section of H Lyman-Alpha. *D. E. Shemansky, J. M. Ajello, and D. T. Hall*. **315**, 408, 44-C14 (1987) (Orig. paper in **296**, 765, 98-D6)
- SHEVGAONKAR, R. K. The Plasma and Magnetic Field Properties of Coronal Loops Observed at High Spatial Resolution. *D. F. Webb, G. D. Holman, J. M. Davis, M. R. Kundu, and R. K. Shevgaonkar*. **315**, 716, 48-D11 (1987)
- SHIBAZAKI, N. Power Spectra of Quasi-periodic Oscillations in Luminous X-Ray Stars. *N. Shibazaki and F. K. Lamb*. **318**, 767, 89-C11 (1987)
- Coherence Effects on Quasi-periodic Oscillations from Galactic X-Ray Sources. *R. F. Elsner, N. Shibazaki, and M. C. Weisskopf*. **320**, 527, 115-C8 (1987)
- The Effect of Decay of the Amplitude of Oscillation on Random Process Models for QPO X-Ray Stars. *N. Shibazaki, R. F. Elsner, and M. C. Weisskopf*. **322**, 831, 149-A1 (1987)
- SHIELDS, G. A. The Composition Gradient across M81. *D. R. Garnett and G. A. Shields*. **317**, 82, 64-G7 (1987)
- On the Origin of Dwarf Galaxies. *Joseph Silk, Rosemary F. G. Wyse, and G. A. Shields*. **322**, L59, 152-A9 (1987)
- SHINE, R. A. SMM Observations of Si IV and O IV Bursts in Solar Active Regions. *Marion Hayes and R. A. Shine*. **312**, 943, 13-C6 (1987)
- SHIPMAN, HARRY L. The DBA White Dwarf Stars in the Palomar-Green Sample. *Harry L. Shipman, James Liebert, and Richard F. Green*. **315**, 239, 42-E8 (1987)
- SHORE, STEVEN N. The Effects of Stimulated Star Formation on the Evolution of the Galaxy. III. The Chemical Evolution of Nonlinear Systems. *Steven N. Shore, Federico Ferrini, and Francesco Palla*. **316**, 663, 59-C14 (1987)
- SHU, FRANK H. Spectral Evolution of Young Stellar Objects. *Fred C. Adams, Charles J. Lada, and Frank H. Shu*. **312**, 788, 11-E3 (1987)
- On Statistical Mechanical Theories of Violent Relaxation. *Frank H. Shu*. **316**, 502, 57-E1 (1987)
- SHU, P. K. Structure in the Nucleus of NGC 1068 at 10 Microns. *R. Tresch-Fienberg, G. G. Fazio, D. Y. Gezari, W. F. Hoffmann, G. M. Lamb, P. K. Shu, and C. R. McCreight*. **312**, 542, 8-G2 (1987)
- SHULL, J. MICHAEL. Broad, Variable Absorption Lines in the Seyfert Galaxy NGC 3516: Probing the Structure of the Emission-Line Regions. *G. Mark Voit, J. Michael Shull, and Mitchell C. Begelman*. **316**, 573, 58-C5 (1987)
- Inside Supernova 1987A. *Richard McCray, J. Michael Shull, and Peter Sutherland*. **317**, L73, 78-C7 (1987)
- Can Quasars Ionize the Intergalactic Medium? *Megan Donahue and J. Michael Shull*. **323**, L13, 158-B1 (1987)
- SHUMARD, E. see SVOBODA, R. et al.
- SHURE, M. A. Direct Infrared Imaging of VB 8. *M. F. Skrutskie, W. J. Forrest, and M. A. Shure*. **312**, L55, 14-C11 (1987)
- SHUTER, W. L. H. Velocity Waves in 21 Centimeter Self-Absorption toward the Taurus Molecular Complex. *W. L. H. Shuter, R. L. Dickman, and C. Klatt*. **322**, L103, 152-D8 (1987)
- SIAM, M. JAVAD. Beam Models for Radio Sources. VI. Evolution of Magnetized Jets in Power-Law Potentials. *M. Javad Siah and Paul J. Wiita*. **313**, 623, 23-E8 (1987)
- SIKORA, MAREK. Thermal and Dynamical Effects of Pair Production on Two-Temperature Accretion Flows. *Mitchell C. Begelman, Marek Sikora, and Martin J. Rees*. **313**, 689, 24-C12 (1987)
- Electron Injection by Relativistic Protons in Active Galactic Nuclei. *Marek Sikora, John G. Kirk, Mitchell C. Begelman, and Peter Schneider*. **320**, L81, 121-B1 (1987)
- Inverse Compton Scattering of Ambient Radiation by a Cold Relativistic Jet: A Source of Beamed, Polarized Continuum in Blazars? *Mitchell C. Begelman and Marek Sikora*. **322**, 650, 146-G12 (1987)
- SILBERBERG, REIN. Distributed Reacceleration of Cosmic Rays. *Amri Wandel, David Eichler, John R. Letaw, Rein Silberberg, and C. H. Tsao*. **316**, 676, 59-D13 (1987)
- SILK, J. Bimodal Star Formation: Constraints from the Solar Neighborhood. *Rosemary F. G. Wyse and J. Silk*. **313**, L11, 21-A13 (1987)
- SILK, JOSEPH. A Gamma-Ray Constraint on the Nature of Dark Matter. *Joseph Silk and Hans Bloemen*. **313**, L47, 27-B5 (1987)
- Ionization-regulated Star Formation in Magnetized Molecular Clouds. *Ralph E. Pudritz and Joseph Silk*. **316**, 213, 52-C10 (1987)
- Does Lower α Allow a Resolution of the Large-Scale Structure Problem? *Joseph Silk and Nicola Vittorio*. **317**, 564, 72-C8 (1987)
- Bimodal Star Formation: Constraints from Galaxy Colors at High Redshift. *Rosemary F. G. Wyse and Joseph Silk*. **319**, L1, 100-A4 (1987)
- Cosmic String Waves. *Albert Stebbins, Shoba Veeraraghavan, Robert Brandenberger, Joseph Silk, and Neil Turok*. **322**, 1, 138-A7 (1987)
- On the Origin of Dwarf Galaxies. *Joseph Silk, Rosemary F. G. Wyse, and G. A. Shields*. **322**, L59, 152-A9 (1987)
- Double Inflation: A Possible Resolution of the Large-Scale Structure Problem. *Michael S. Turner, Jens V. Villumsen, Nicola Vittorio, Joseph Silk, and Roman Juszkiewicz*. **323**, 423, 159-C1 (1987)
- Minimal Cosmic Background Fluctuations Implied by Streaming Motions. *Roman Juszkiewicz, Krzysztof Górski, and Joseph Silk*. **323**, L1, 158-A4 (1987)
- Primeval Galaxies and Cold Dark Matter. *Joseph Silk and Alexander Szalay*. **323**, L107, 164-B4 (1987)
- SILVA, A. Observation of the OH 1667 MHz Line toward Comet Halley from the Southern Hemisphere. *E. Bajaja, R. Morras, W. G. L. Pöppel, J. E. Cersosimo, M. C. Martin, J. Mazzaro, J. C. Olalde, A. Silva, E. M. Arnal, F. R. Colomb, I. F. Mirabel, and V. Boriakoff*. **322**, 549, 144-A1 (1987)
- SILVA, A. M. Comet Halley: OH Absorption of Galactic Background Radio Sources. *E. Bajaja, E. M. Arnal, J. C. Cersosimo, F. R. Colomb, M. C. Martin, J. Mazzaro, R. Morras, J. C. Olalde, W. G. L. Pöppel, A. M. Silva, I. F. Mirabel, and V. Boriakoff*. **313**, 906, 26-F2 (1987)
- SILVERGLATE, PETER R. Atomic Hydrogen in Planetary Nebulae. *Stephen E. Schneider, Peter R. Silverglate, Daniel R. Altschuler, and Carlo Giovanardi*. **314**, 572, 35-G1 (1987)
- SIMMONS, KAREN E. Features in Saturn's Rings. *Larry W. Esposito, Craig C. Harris, and Karen E. Simmons*. **63**, 749, 11-G1 (1987) (Abstr. in **313**, 931, 26-G14)
- SIMON, M. The Infrared Emission-Line Spectrum of γ Cassiopeiae. *F. Hamann and M. Simon*. **318**, 356, 82-F10 (1987)
- Milliarcsecond Resolution Infrared Observations of Young Stars in Taurus and Ophiuchus. *M. Simon, R. R. Howell, A. J. Longmore, B. A. Wilking, D. M. Peterson, and W.-P. Chen*. **320**, 344, 111-G3 (1987)
- Molecular Hydrogen Line Emission in Seyfert Galactic Nuclei. *J. Fischer, T. R. Geballe, Howard A. Smith, M. Simon, and J. W. V. Storey*. **320**, 667, 117-B2 (1987)
- SIMON, MANFRED. Antiproton Production of Propagating Cosmic Rays under Distributed Reacceleration. *Manfred Simon, U. Heinbach, and Ch. Koch*. **320**, 699, 117-D6 (1987)
- SIMON, R. S. 1928 + 738: A Superluminal Source with Large-Scale Structure. *K. J. Johnston, R. S. Simon, A. Eckart, P. Biermann, C. Schalinski, A. Witzel, and R. G. Strom*. **313**, L85, 27-D11 (1987)
- 92 Centimeter VLBI Structure of the Elliptical Galaxy MCG 5-4-18: Erratum. *J. M. Wrobel and R. S. Simon*. **316**, 858, 61-D14 (1987) (Orig. paper in **309**, 593, 127-F6)
- SIMON, THEODORE. Two Micron CO Absorption Lines in the Spectrum of Epsilon Aurigae during Eclipse. *Kenneth H. Hinkle and Theodore Simon*. **315**, 296, 43-B9 (1987)
- The Dependence of Ultraviolet Chromospheric Emission upon Rotation among Late-Type Stars. *Theodore Simon and Francis C. Fekel, Jr.*. **316**, 434, 54-G2 (1987)
- SIMPSON, J. A. Cosmic Ray Propagation in the Galaxy and in the Heliosphere: The Path-Length Distribution at Low Energy. *M. Garcia-Munoz, J. A. Simpson, T. G. Guzik, J. P. Wefel, and S. H. Margolis*. **64**, 269, 19-F6 (1987) (Abstr. in **315**, 733, 48-E14)
- SINCLAIR, see SVOBODA, R. et al.
- SINGH, JAGDEV. Chromospheric Ca II K-Line Variations in the Sun as a Star over a Solar Cycle. *K. R. Sivaraman, Jagdev Singh, S. P. Bagare, and S. S. Gupta*. **313**, 456, 20-A6 (1987)
- SINGH, K. P. Observations of Soft X-Ray Spectra from a Seyfert 1 and a Narrow Emission-Line Galaxy: Erratum. *K. P. Singh, G. P. Garmire, and J. Nousek*. **312**, 484, 6-B10 (1987) (Orig. paper in **297**, 633, 108-D10)
- A 9 Month Long Soft X-Ray Survey of the Large Magellanic Cloud. I. X-Ray Map at 1/4 keV. *K. P. Singh, J. A. Nousek, D. N. Burrows, and G. P. Garmire*. **313**, 185, 17-A7 (1987)
- X-Ray Observations of the Supernova Remnant N103B in the Large Magellanic Cloud. *K. P. Singh, N. J. Westergaard, H. W. Schnopper, and D. J. Helfand*. **322**, 80, 138-G3 (1987)
- SION, EDWARD M. Further Observations of the Peculiar Hot Helium-rich Degenerate KPD 0005 + 5106. *Ronald A. Downes, Edward M. Sion, James Liebert, and J. B. Holberg*. **321**, 943, 134-G7 (1987)
- A Catalog of Spectroscopically Identified White Dwarfs. *George P. McCook and Edward M. Sion*. **65**, 603, 37-E2 (1987) (Abstr. in **322**, 1076, 151-G2)
- SISCOE, G. L. Centrifugal Field Line Breaking: An Upper Limit to Io Mass Injection. *T. S. Huang and G. L. Siscoe*. **312**, 475, 6-B1 (1987)
- Corotation Lag Limit on Mass-Loss Rate from Io. *T. S. Huang and G. L. Siscoe*. **319**, 1003, 106-A1 (1987)

- SIVARAMAN, K. R. Chromospheric Ca II K-Line Variations in the Sun as a Star over a Solar Cycle. *K. R. Sivaraman, Jagdev Singh, S. P. Bagare, and S. S. Gupta*. **313**, 456, 20-A6 (1987)
- SKINNER, T. E. Detection of Neutral Oxygen and Sulfur Emissions near 10 Using IUE. *G. E. Ballester, H. W. Moos, P. D. Feldman, D. F. Strobel, M. E. Summers, J.-L. Bertaux, T. E. Skinner, M. C. Festou, and J. H. Lieske*. **319**, L33, 100-D1 (1987)
- SKRUTSKIE, M. F. Direct Infrared Imaging of VB 8. *M. F. Skrutskie, W. J. Forrest, and M. A. Shure*. **312**, L55, 14-C11 (1987)
- SKRUTSKIE, MIKE. Observations of Infrared Emission Lines and Radio Continuum Emission from Pre-Main-Sequence Objects. *Neal J. Evans II, Russell M. Lebreault, S. Beckwith, and Mike Skrutskie*. **320**, 364, 112-A9 (1987)
- SKUMANICH, A. Stokes Profile Analysis and Vector Magnetic Fields. III. Extended Temperature Minima of Sunspot Umbrae as inferred from Stokes Profiles of Mg I $\lambda 4571$. *B. W. Lites, A. Skumanich, D. E. Rees, G. A. Murphy, and M. Carlsson*. **318**, 930, 91-B6 (1987)
- Stokes Profile Analysis and Vector Magnetic Fields. I. Inversion of Photospheric Lines. *A. Skumanich and B. W. Lites*. **322**, 473, 143-B8 (1987)
- The Polarization Properties of Model Sunspots: The Broad-Band Polarization Signature of the Schlüter-Temesváry Representation. *A. Skumanich and B. W. Lites*. **322**, 483, 143-C4 (1987)
- SLOVAK, MARK H. Observational Studies of Cepheids. V. Radial Velocities of Bright Cepheids. *Thomas G. Barnes III, Thomas J. Moffett, and Mark H. Slovak*. **65**, 307, 32-E1 (1987) (Abstr. in **320**, 937, 120-B2)
- SMALLEY, R. E. Long Carbon Chain Molecules in Circumstellar Shells. *H. W. Kroto, J. R. Heath, S. C. O'Brien, R. F. Curl, and R. E. Smalley*. **314**, 352, 32-A9 (1987)
- SMARR, LARRY. Degenerate Dwarf Binaries as Promising, Detectable Sources of Gravitational Radiation. *Charles R. Evans, Icko Iben, Jr., and Larry Smarr*. **323**, 129, 154-E1 (1987)
- SMEYERS, P. Asymptotic Approximations for Higher Order Nonradial Oscillations of a Spherically Symmetric Star. *P. Smeyers and M. Tassoul*. **65**, 429, 34-B11 (1987) (Abstr. in **321**, 1051, 136-A2)
- SMITH, ANDREW M. Vacuum Ultraviolet Images of the Large Magellanic Cloud. *Andrew M. Smith, Robert M. Cornett, and Robert S. Hill*. **320**, 609, 116-C9 (1987)
- SMITH, BEVERLY J. A Study of a Flux-limited Sample of IRAS Galaxies. *Beverly J. Smith, S. G. Kleinmann, J. P. Huchra, and F. J. Low*. **318**, 161, 80-F5 (1987)
- SMITH, DAVID. Ion-Molecule Calculation of the Abundance Ratio of CCD to CCH in Dense Interstellar Clouds. *Eric Herbst, Nigel G. Adams, David Smith, and D. J. DeFrees*. **312**, 351, 4-F7 (1987)
- On the Synthesis of c-C₃H₂ in Interstellar Clouds. *Nigel G. Adams and David Smith*. **317**, L25, 71-B13 (1987)
- SMITH, GRAEME H. Chemical Enrichment of Halo Protoclusters with Differing Stellar Mass Functions. *Graeme H. Smith and Robert D. McClure*. **316**, 206, 52-C3 (1987)
- Chemical Enrichment of Halo Protoclusters with Differing Stellar Mass Functions: Erratum. *Graeme H. Smith and Robert D. McClure*. **322**, 1074, 151-F12 (1987) (Orig. paper in **316**, 206, 52-C3)
- Spectroscopy of the $\lambda 7699$ K I Line among Globular Cluster Giants. *Bruce Campbell and Graeme H. Smith*. **323**, L69, 158-E11 (1987)
- SMITH, HARDING E. Spectrophotometry of Six Broad Absorption Line QSOs. *Vesa T. Junkkarinen, E. Margaret Burbidge, and Harding E. Smith*. **317**, 460, 69-A7 (1987)
- The Nature of the BL Lacertae Object AO 0235 + 164. *Ross D. Cohen, Harding E. Smith, Vesa T. Junkkarinen, and E. Margaret Burbidge*. **318**, 577, 87-C1 (1987)
- Emission-Line Variability and the Broad-Line Region of Quasi-stellar Objects. I. Time Scales and Photon Densities. *Wei Zheng, E. Margaret Burbidge, Harding E. Smith, Ross D. Cohen, and Steven E. Bradley*. **322**, 164, 139-F5 (1987)
- SMITH, HOWARD A. Infrared Line Observations of Low-Luminosity Outflow Sources. *Howard A. Smith, J. Fischer, T. R. Geballe, and P. R. Schwartz*. **316**, 265, 52-G12 (1987)
- Molecular Hydrogen Line Emission in Seyfert Galactic Nuclei. *J. Fischer, T. R. Geballe, Howard A. Smith, M. Simon, and J. W. V. Storey*. **320**, 667, 117-B2 (1987)
- SMITH, J. Dust Reradiation from M43. *J. Smith, D. A. Harper, and R. F. Loewenstein*. **314**, 76, 28-G7 (1987)
- SMITH, KERMIT L. Simultaneous SMM Flat Crystal Spectrometer and Very Large Array Observations of Solar Active Regions. *Kenneth R. Lang, Robert F. Willson, Kermit L. Smith, and Keith T. Strong*. **322**, 1035, 151-C4 (1987)
- Solar Active Region Physical Parameters Inferred from a Thermal Cyclotron Line and Soft X-Ray Spectral Lines. *Kenneth R. Lang, Robert F. Willson, Kermit L. Smith, and Keith T. Strong*. **322**, 1044, 151-D3 (1987)
- SMITH, M. G. see MAKINO, F., et al.
- SMITH, MALCOLM. Near-Infrared Spectra of Seyfert Nuclei. I. The Reddening Problem. *Martin J. Ward, Thomas Geballe, Malcolm Smith, Richard Wade, and Peredur Williams*. **316**, 138, 51-D13 (1987)
- SMITH, MYRON A. The Nonradial Oscillations of ϵ Persei. II. Nonlinear Characteristics. *Myron A. Smith, Alexander W. Fullerton, and John R. Percy*. **320**, 768, 118-B10 (1987)
- SMITH, P. F. Feasibility of Cosmic Neutrino Detectors Based on Coherent Interaction with Superconductors. *P. F. Smith and J. D. Lewin*. **318**, 738, 89-A10 (1987)
- SMITH, P. H. Evidence for Periodic Radial Velocity Variations in Arcturus. *P. H. Smith, R. S. McMillan, and W. J. Merline*. **317**, L79, 78-C12 (1987)
- SMITH, PAUL S. Optical and Near-Infrared Observations of BL Lacertae Objects and Active Quasars. *Paul S. Smith, Thomas J. Balonek, Richard Elston, and Paul A. Heckert*. **64**, 459, 22-G9 (1987) (Abstr. in **316**, 860, 61-E2)
- SMITH, PETER L. Absolute Oscillator Strengths for 108 Lines of Si I between 163 and 410 Nanometers. *Peter L. Smith, M. C. E. Huber, G. P. Tozzi, H. E. Griesinger, B. L. Cardon, and G. G. Lombardi*. **322**, 573, 144-B12 (1987)
- SMITH, VERNE V. Neutron-Exposure Variations in MS and S Stars, and the Implications for s-Process Nucleosynthesis. *Verne V. Smith, David L. Lambert, and Andrew McWilliam*. **320**, 862, 119-C3 (1987)
- SMOOT, GEORGE F. Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. *George F. Smoot, Marc Bershadoun, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Wittebsky*. **317**, L45, 78-A9 (1987)
- SNELL, R. L. CS Observations of L1551: No Rotating Disk. *G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, and G. L. Grasdale*. **317**, L95, 78-D13 (1987)
- High-Resolution Images of the L1551 Bipolar Outflow: Evidence for an Expanding, Accelerated Shell. *G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, F. P. Schloerb, K. M. Strom, and G. L. Grasdale*. **319**, 742, 103-B6 (1987)
- SNELL, RONALD L. 1300 Micron Continuum Observations of the Sagittarius B2 Molecular Cloud Core. *Paul F. Goldsmith, Ronald L. Snell, and Dariusz C. Lis*. **313**, L5, 21-A8 (1987)
- Small-Scale Structure and Chemical Differential in the Central Regions of the Sagittarius B2 Molecular Cloud. *Paul F. Goldsmith, Ronald L. Snell, T. Hasegawa, and N. Ukita*. **314**, 525, 35-C6 (1987)
- Models of Molecular Cloud Cores. III. A Multitransition Study of H₂CO. *Lee G. Mundy, Neal J. Evans II, Ronald L. Snell, and Paul F. Goldsmith*. **318**, 392, 83-B11 (1987)
- 1300 Micron Continuum and C¹⁸O Line Mapping of the Giant Molecular Cloud Cores in Orion, W49, and W51. *F. Peter Schloerb, Ronald L. Snell, and P. R. Schwartz*. **319**, 426, 97-G5 (1987)
- A Survey of IRAS Point Sources in Taurus for High-Velocity Molecular Gas. *Mark H. Heyer, Ronald L. Snell, Paul F. Goldsmith, and Philip C. Myers*. **321**, 370, 126-C3 (1987)
- The Magnetic Evolution of the Taurus Molecular Clouds. I. Large-scale Properties. *Mark H. Heyer, Frederick J. Vrba, Ronald L. Snell, F. P. Schloerb, Stephen E. Strom, Paul F. Goldsmith, and Karen M. Strom*. **321**, 855, 133-G9 (1987)
- SNIDERS, M. A. J. A Detailed Study of the C IV $\lambda 1550$ Line Profile and Adjacent Spectral Features in NGC 4151 from 1978 to 1983. *J. Clavel, A. Altamore, A. Boksenberg, G. E. Bromage, A. Elvius, D. Pelat, M. V. Penston, G. C. Perola, M. A. J. Snijders, and M. H. Ulrich*. **321**, 251, 125-A5 (1987)
- SNODGRASS, HERSCHEL B. Spectroscopic Evidence for a Moving Pattern of Azimuthal Rolls on the Sun. *Herschel B. Snodgrass*. **316**, L91, 62-D8 (1987)
- SNOW, T. P. Highly Ionized Stellar Winds in Be Stars: The Evidence for Aspect Dependence. *C. A. Grady, K. S. Bjorkman, and T. P. Snow*. **320**, 376, 112-B8 (1987)
- SNOW, THEODORE P. CCD Observations of Diffuse Interstellar Bands in Reflection Nebulae. *Karl Josaftsson and Theodore P. Snow*. **319**, 436, 98-A1 (1987)
- High-Resolution Ultraviolet Observations of Interstellar Lines toward ζ Persei Observed with the Balloon-borne Ultraviolet Spectrometer. *Theodore P. Snow, H. J. G. L. M. Lamers, and Charles L. Joseph*. **321**, 952, 135-A2 (1987)
- SNOW, THEODORE P., JR. Extinction and Abundance Properties of Alpha Scorpii Circumstellar Grains. *Theodore P. Snow, Jr., Richard H. Buss, Jr., D. P. Gilra, and J. P. Swings*. **321**, 921, 134-E13 (1987)
- SNYDER, L. E. High-Excitation SiO Masers in Evolved Stars. *P. R. Jewell, Dale F. Dickinson, L. E. Snyder, and D. P. Clemens*. **323**, 749, 163-A1 (1987)
- SNYDER, W. A. Spartan 1 X-Ray Observations of the Perseus Cluster: Comparison of the Iron Abundances and Temperatures in the Inner and Outer Regions of the Cluster. *M. P. Ulmer, R. G. Cruddace, E.*

- E. Fenimore, G. G. Fritz, and W. A. Snyder. **319**, 118, 94-C11 (1987)
- SOARES, I. DAMIÃO. Magnetohydrodynamic Cosmologies with a Bertotti-Robinson-like Limit. *R. Portugal and I. Damião Soares*. **316**, 483, 57-C9 (1987)
- SOBEL, H. W. see SVOBODA, R. *et al.*
- SODROSKI, T. J. Large-Scale Galactic Dust Morphology and Physical Conditions from IRAS Observations. *T. J. Sodroski, E. Dwek, M. G. Hauser, and F. J. Kerr*. **322**, 101, 139-A10 (1987)
- SOFIA, SABATINO. Deep Einstein X-Ray Imagery of the Small Magellanic Cloud. *Frederick C. Bruhweiler, Daniel A. Klinglesmith III, Theodore R. Gull, and Sabatino Sofia*. **317**, 152, 65-E11 (1987)
- SOFUE, YOSHIKI. A Shocked-Jet Model of the Galactic Center Bridge and the Radio Arc. *Yoshiaki Sofue and Mitsuaki Fujimoto*. **319**, L73, 107-D11 (1987)
- SOIFER, B. T. Detection of CO(1 \rightarrow 0) Emission and Optical Imaging of the Seyfert Galaxy/QSO Markarian 231. *D. B. Sanders, J. S. Young, N. Z. Scoville, B. T. Soifer, and G. E. Danielson*. **312**, L5, 7-A8 (1987)
- Compact Molecular Gas Structure in the Interacting Galaxy Pair Arp 299 (IC 694-NGC 3690). *A. I. Sargent, D. B. Sanders, N. Z. Scoville, and B. T. Soifer*. **312**, L35, 14-B1 (1987)
- The Most Luminous Far-Infrared Extragalactic Sources. *M. Harwit, J. R. Houck, B. T. Soifer, and G. G. C. Palumbo*. **315**, 28, 40-C6 (1987)
- The IRAS Bright Galaxy Sample. II. The Sample and Luminosity Function. *B. T. Soifer, D. B. Sanders, B. F. Madore, G. Neugebauer, G. E. Danielson, J. H. Elias, Carol J. Lonsdale, and W. L. Rice*. **320**, 238, 110-F7 (1987)
- Continuum Energy Distributions of Quasars in the Palomar-Green Survey. *G. Neugebauer, R. F. Green, K. Matthews, M. Schmidt, B. T. Soifer, and J. Bennett*. **63**, 615, 10-A7 (1987) (Abstr. in **313**, 929, 26-G12)
- SOKER, NOAM. Massive Disk Formation from the Collision of a Main-Sequence Star with a White Dwarf in a Globular Cluster Core. *Noam Soker, Oded Regev, Mario Livio, and Michael M. Shara*. **318**, 760, 89-C4 (1987)
- SOKOLSKY, P. Sporadic and Periodic 10-1000 TeV Gamma Rays From Cygnus X-3. *R. M. Baltrusaitis, G. L. Cassidy, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebing, C. P. Lingle, E. C. Loh, P. Sokolsky, P. Sommers, and D. Steck*. **323**, 685, 162-C1 (1987)
- SOLENSKY, RICHARD. Finsen 342 and the Hyades Distance Modulus. *Deane M. Peterson and Richard Solensky*. **315**, 286, 43-A13 (1987)
- SOLIVELLA, GLADYS. Stellar Multiplicity in the Scorpius-Centaurus Association. *Hugo Levato, Stella Malaroda, Nidia Morrell, and Gladys Solivella*. **64**, 487, 23-B8 (1987) (Abstr. in **315**, 731, 48-E12)
- SOLOMON, P. M. Mass, Luminosity, and Line Width Relations of Galactic Molecular Clouds. *P. M. Solomon, A. R. Rivolo, J. Barrett, and A. Yahil*. **319**, 730, 103-A8 (1987)
- The Extraordinary CO Luminosity of the Far-Infrared Galaxy VII Zw 31: A Possible Proto-Galactic Disk? *Leslie J. Sage and P. M. Solomon*. **321**, L103, 137-A9 (1987)
- SOMMERS, P. Sporadic and Periodic 10-1000 TeV Gamma Rays From Cygnus X-3. *R. M. Baltrusaitis, G. L. Cassidy, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebing, C. P. Lingle, E. C. Loh, P. Sokolsky, P. Sommers, and D. Steck*. **323**, 685, 162-C1 (1987)
- SONNEBORN, G. Periodic Photospheric and Chromospheric Modulation in Alpha Orionis (Betelgeuse). *A. K. Dupree, S. L. Baliunas, E. F. Guinan, L. Hartmann, G. E. Nassiopoulos, and G. Sonneborn*. **317**, L86, 78-D4 (1987)
- The Interstellar Medium toward Supernova 1987A. *A. K. Dupree, R. P. Kirshner, G. E. Nassiopoulos, J. C. Raymond, and G. Sonneborn*. **320**, 597, 116-B11 (1987)
- SONNEBORN, GEORGE. Ultraviolet Observations of SN 1987A. *Robert P. Kirshner, George Sonneborn, D. Michael Crenshaw, and George E. Nassiopoulos*. **320**, 602, 116-C2 (1987)
- The Progenitor of SN 1987A: Spatially Resolved Ultraviolet Spectroscopy of the Supernova Field. *George Sonneborn, Bruce Aliner, and Robert P. Kirshner*. **323**, L35, 158-C7 (1987)
- Recurrent Episodic Mass Loss in a B2e Star: 66 Ophiuchi, 1982-1985. *C. A. Grady, George Sonneborn, Chi-Chao Wu, and H. F. Henrichs*. **65**, 673, 39-A2 (1987) (Abstr. in **322**, 1077, 151-G3)
- SOONG, YANG. Two Binary Cycles of GX 301 - 2. *Richard E. Rothschild and Yang Soong*. **315**, 154, 41-F6 (1987)
- A Rapid Change of the Hercules X-1 Pulse Profile and High-State Duration. *Yang Soong, Duane E. Gruber, and Richard E. Rothschild*. **319**, L77, 107-E3 (1987)
- SORRELL, WILFRED H. Origin and Acceleration of 10^{20} eV Cosmic-Ray Protons. *Wilfred H. Sorrell*. **323**, 647, 161-G1 (1987)
- SOWELL, J. R. Spectrophotometry of Epsilon Aurigae. *D. T. Thompson, B. L. Lutz, G. W. Lockwood, and J. R. Sowell*. **321**, 450, 127-B1 (1987)
- SOWELL, JAMES R. Yellow Evolved Stars in Open Clusters. *James R. Sowell*. **64**, 241, 19-D5 (1987) (Abstr. in **315**, 732, 48-E13)
- SPAMER, E. Radiative Transitions in ^{27}Al and Their Relevance to the ^{26}Al (p, γ) ^{27}Si Reaction under Stellar Conditions. *C. Rangacharyulu, G. Kuechler, A. Richter, and E. Spamer*. **320**, 405, 112-D9 (1987)
- SPANGLER, STEVEN R. VLA and Low-Frequency VLB1 Observations of the Radio Source 0503 + 467: Austere Constraints on Interstellar Scattering in Two Media. *Steven R. Spangler, Alan L. Fey, and James M. Cordes*. **322**, 909, 149-G3 (1987)
- SPARKS, L. Nonlinear Radiative Condensation in a Sheared Magnetic Field. *G. Van Hoven, L. Sparks, and D. D. Schnack*. **317**, L91, 78-D9 (1987)
- SPARKS, WARREN M. Stellar Accretion of Matter Possessing Angular Momentum. *G. Siegfried Kutter and Warren M. Sparks*. **321**, 386, 126-D7 (1987)
- Nuclear Runaways in a C/O White Dwarf Accreting H-rich Material Possessing Angular Momentum. *Warren M. Sparks and G. Siegfried Kutter*. **321**, 394, 126-E1 (1987)
- SPENCER, J. H. Evidence for Refractive Scintillation of Two Extragalactic Sources Seen through the Galactic Disk. *Brian Dennison, R. Fiedler, K. J. Johnston, J. H. Spencer, E. B. Waltman, P. E. Angerhofer, D. R. Florkowski, F. J. Jostes, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. **313**, 141, 16-E5 (1987)
- H₂O Masers in Circumstellar Envelopes. *Adair P. Lane, K. J. Johnston, P. F. Bowers, J. H. Spencer, and P. J. Diamond*. **323**, 756, 163-A8 (1987)
- Daily Observations of Compact Extragalactic Radio Sources at 2695 and 8085 MHz, 1979-1985. *R. L. Fiedler, E. B. Waltman, J. H. Spencer, K. J. Johnston, P. E. Angerhofer, D. R. Florkowski, F. J. Jostes, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. **65**, 319, 33-A5 (1987) (Abstr. in **321**, 1050, 136-A1)
- SPENCER, RALPH E. The Inner Beams of SS 433. *Jonathan D. Romney, Richard T. Schilizzi, István Fejes, and Ralph E. Spencer*. **321**, 822, 133-E3 (1987)
- SPIRGEL, DAVID. Gamma-Ray Bursts from Superconducting Cosmic Strings at Large Redshifts. *Arif Babul, Bohdan Paczyński, and David Spigler*. **316**, L49, 62-A9 (1987)
- SPINRAD, HYRON. Extended Lyman- α Emission in 3C 326.1: A 100 Kiloparsec Cloud of Ionized Gas at a Redshift of 1.82. *Patrick J. McCarthy, Hyron Spinrad, S. Djorgovski, Michael A. Strauss, Wil van Breugel, and James Liebert*. **319**, L39, 107-B2 (1987)
- A Correlation between the Radio and Optical Morphologies of Distant 3CR Radio Galaxies. *Patrick J. McCarthy, Wil van Breugel, Hyron Spinrad, and S. Djorgovski*. **321**, L29, 129-D3 (1987)
- SPRANGLE, P. Electron Cyclotron Harmonic Wave Acceleration. *H. Karimabadi, C. R. Menyuk, P. Sprangle, and L. Vlahos*. **316**, 462, 55-B2 (1987)
- SPRANGLE, PHILLIP. Evolution of the Axial Electron Cyclotron Maser Instability, with Applications to Solar Microwave Spikes. *Loukas Vlahos and Phillip Sprangle*. **322**, 463, 143-A10 (1987)
- STABELL, R. The Extragalactic Background Light and a Definitive Resolution of Olbers's Paradox. *Paul S. Wesson, K. Valle, and R. Stabell*. **317**, 601, 72-F5 (1987)
- STACEY, G. J. Submillimeter and Far-Infrared Spectroscopy of M17 and S106: UV-Heated, Quiescent Molecular Gas? *A. I. Harris, J. Stutzki, R. Genzel, J. B. Lugten, G. J. Stacey, and D. T. Jaffe*. **322**, L49, 145-D6 (1987)
- STACEY, GORDON J. Detection of Interstellar CH in the Far-Infrared. *Gordon J. Stacey, J. B. Lugten, and R. Genzel*. **313**, 859, 26-B9 (1987)
- STAFF. Volume Contents Page for Volume 313: Erratum. *Staff*. **319**, L115, 107-G11 (1987)
- STAMM, R. Partial Redistribution in High-Density, Highly Ionized Plasmas. *B. Talin, R. Stamm, V. P. Kaftandjian, and Lewis Klein*. **322**, 804, 148-E12 (1987)
- STANEV, TODOR. Constraints on Models of Cygnus X-3 from High-Energy Gamma-Ray Absorption at Source. *R. J. Protheroe and Todor Stanev*. **322**, 838, 149-A8 (1987)
- STANG, P. D. A New Constraint on the Galactic Plane ^{26}Al Distribution. *C. J. MacCullum, A. F. Hutters, P. D. Stang, and M. Leventhal*. **317**, 877, 75-F1 (1987)
- STARK, ANTONY A. Molecules in Galaxies. V. CO Observations of Flocculent and Grand-Design Spirals. *Antony A. Stark, Bruce G. Elmegreen, and Don Chance*. **322**, 64, 138-F1 (1987)
- Galactic Center Molecular Clouds. I. Spatial and Spatial-Velocity Maps. *John Bally, Antony A. Stark, Robert W. Wilson, and Christian Henkel*. **65**, 13, 28-B2 (1987) (Abstr. in **319**, 1011, 106-A9)
- STARRFIELD, SUMNER G. Pulsations of White Dwarf Stars with Thick Hydrogen or Helium Surface Layers. *Arthur N. Cox, Sumner G. Starrfield, Russell B. Kidman, and W. Dean Pesnell*. **317**, 303, 67-B14 (1987)
- STARRFIELD, SUMNER. The Effect of Heating from the Boundary Layer on

- Accretion Models for Novae and Other Compact Objects. *Giora Shaviv and Sumner Starrfield*. **321**, L51, 129-F3 (1987)
- STARS, ANTONY A. Filamentary Structure in the Orion Molecular Cloud. *John Bally, William D. Langer, Antony A. Stars, and Robert W. Wilson*. **312**, L45, 14-B12 (1987)
- STATLER, THOMAS S. Evolution of N-Body Systems with Tidally Captured Binaries through the Core Collapse Phase. *Thomas S. Statler, Jeremiah P. Ostriker, and Haldan N. Cohn*. **316**, 626, 58-G9 (1987)
- Self-consistent Models of Perfect Triaxial Galaxies. *Thomas S. Statler*. **321**, 113, 123-D1 (1987)
- STAUE, H. J. A New Cometary Nebula in Cygnus. *Th. Neckel and H. J. Staue*. **320**, L145, 121-F1 (1987)
- Temporal Changes of the IRS 5 Jet in L1551. *Th. Neckel and H. J. Staue*. **322**, L27, 145-B13 (1987)
- STAUFFER, JOHN R. The Distribution of Rotational Velocities for Low-Mass Stars in the Pleiades. *John R. Stauffer and Lee W. Hartmann*. **318**, 337, 82-E5 (1987)
- Rotational Velocities of Low-Mass Stars in the Hyades. *John R. Stauffer, Lee W. Hartmann, and David W. Latham*. **320**, L51, 114-D12 (1987)
- STEBBINS, ALBERT. Cosmic String Waves. *Albert Stebbins, Shoba Veeraraghavan, Robert Brandenberger, Joseph Silk, and Neil Turok*. **322**, 1, 138-A7 (1987)
- STECHER, T. P. The Unusual Dust-scattering Properties in the Reflection Nebula CED 201. *A. N. Witt, R. C. Bohlin, T. P. Stecher, and S. M. Graff*. **321**, 912, 134-E4 (1987)
- STECHER, THEODORE P. Physical Parameters for 12 Planetary Nebulae and Their Central Stars in the Magellanic Clouds. *Lawrence H. Aller, Charles D. Keyes, Stephen P. Maran, Theodore R. Gull, Andrew G. Michalitsianos, and Theodore P. Stecher*. **320**, 159, 109-F12 (1987)
- STECK, D. Sporadic and Periodic 10–1000 TeV Gamma Rays From Cygnus X-3. *R. M. Baltrusaitis, G. L. Cassiday, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebing, C. P. Lingle, E. C. Loh, P. Sokolsky, P. Sommers, and D. Steck*. **323**, 685, 162-C1 (1987)
- STEEL, T. M. A 217.5 Nanometer Absorption Feature in the Spectrum of Small Silicate Particles. *T. M. Steel and W. W. Duley*. **315**, 337, 43-E8 (1987)
- STEIDEL, CHARLES C. The Effect of the Lyman-Alpha Forest on the Ultraviolet Continuum of Very High Redshift Quasars. *Charles C. Steidel and Wallace L. W. Sargent*. **313**, 171, 16-G7 (1987)
- A New Upper Limit on the Density of Generally Distributed Inter-galactic Neutral Hydrogen. *Charles C. Steidel and Wallace L. W. Sargent*. **318**, L11, 85-A13 (1987)
- Absorption in the Wide QSO Pair Tololo 1037 – 2704 and Tololo 1038 – 2712: Evidence for a Specially Aligned Supercluster at $z = 2$? *Wallace L. W. Sargent and Charles C. Steidel*. **322**, 142, 139-D11 (1987)
- STEIMAN-CAMERON, THOMAS Y. A Possible 1.13 Millisecond Periodicity in GX 339 – 4. *James N. Imamura, Thomas Y. Steiman-Cameron, and John Middleditch*. **314**, L11, 33-B13 (1987)
- Rapid Optical Flaring in MXB 1735 – 444 and an Optical Burst from GX 17 + 2. *James N. Imamura, Thomas Y. Steiman-Cameron, and John Middleditch*. **320**, L41, 114-D3 (1987)
- STEIN, W. A. The Origin of the Photoionizing Continuum of Active Galactic Nuclei and Quasars. *S. L. O'Dell, H. A. Scott, and W. A. Stein*. **313**, 164, 16-F14 (1987)
- A Nonthermal Model for the XUV, Soft X-Ray Emission of AGN and QSOs. *T. W. Jones and W. A. Stein*. **320**, L1, 114-A4 (1987)
- STEINER, J. E. NSV 12615: An Eclipsing Cataclysmic Variable with Ultrashort Period. *F. J. Jablonski and J. E. Steiner*. **313**, 376, 19-A13 (1987)
- On the Stability of the 13.2 Minute Oscillation of V1223 Sagittarii. *F. Jablonski and J. E. Steiner*. **323**, 672, 162-B2 (1987)
- STEINER, JOÃO E. BE Ursae Majoris: A Detached Binary with a Unique Reprocessing Spectrum. *Donald H. Ferguson, James Liebert, Roc Cutri, Richard F. Green, S. P. Willner, João E. Steiner, and Susan Tokarz*. **316**, 399, 54-D4 (1987)
- STEINOLFSON, R. S. Energy Buildup in Coronal Magnetic Flux Tubes. *R. S. Steinolfson and T. Tajima*. **322**, 503, 143-D10 (1987)
- STELLA, L. The Discovery of a Second Orbital Period from the X-Ray Source 4U 1820 – 30 in the Globular Cluster NGC 6624. *L. Stella, W. Priedhorsky, and N. E. White*. **312**, L17, 7-B4 (1987)
- EXOSAT Observations of Double-peaked Bursts with Radius Expansion from 4U/MXB 1820 – 30. *F. Haberl, L. Stella, N. E. White, W. C. Priedhorsky, and M. Gottwald*. **314**, 266, 31-A9 (1987)
- The Discovery of 15–30 Hertz Quasi-periodic Oscillations in the X-Ray flux of 4U 1820 – 30. *L. Stella, N. E. White, and W. Priedhorsky*. **315**, L49, 45-E3 (1987)
- Einstein Observations of EF Eridani (2A 0311 – 227), the Textbook Example of AM Herculis-type Systems. *K. Beuermann, L. Stella, and J. Patterson*. **316**, 360, 54-A6 (1987)
- Intensity and Source State Dependence of the Quasi-periodic Oscillations in Scorpius X-1. *M. van der Klis, L. Stella, N. White, F. Jansen, and A. N. Parmar*. **316**, 411, 54-F3 (1987)
- The Complex Cross-Spectra of Cygnus X-2 and GX 5-1. *M. van der Klis, G. Hasinger, L. Stella, A. Langmeier, J. van Paradijs, and W. H. G. Lewin*. **319**, L13, 100-B2 (1987)
- The Discovery of 7 and 24–28 Hertz Quasi-periodic Oscillations in the X-Ray Flux of GX 17 + 2 (4U 1812 – 14). *L. Stella, A. N. Parmar, and N. E. White*. **321**, 418, 126-F11 (1987)
- STELLINGWERF, R. F. Overtone Pulsation in Stars. *R. F. Stellingwerf, A. Gautschy, and R. J. Dickens*. **313**, L75, 27-D2 (1987)
- Fourier Coefficients of Variable Stars. II. Light-Curve Analysis. *R. F. Stellingwerf and M. Donohoe*. **314**, 252, 30-G8 (1987)
- Fourier Coefficients of the RR Lyrae Variables in NGC 6171. *R. F. Stellingwerf and R. J. Dickens*. **322**, 133, 139-D2 (1987)
- STENDEL, ROBERT E. SiO Cooling Instability in the Envelopes of Cool Giant Stars. *David O. Muchmore, Joseph A. Nuth III, and Robert E. Stencel*. **315**, L141, 49-F10 (1987)
- STERN, C. P. X-Ray Emission Associated with the Jet in 3C 273. *D. E. Harris and C. P. Stern*. **313**, 136, 16-D14 (1987)
- STERNBERG, A. Cosmic-Ray-induced Photodestruction of Interstellar Molecules in Dense Clouds. *A. Sternberg, A. Dalgarno, and S. Lepp*. **320**, 676, 117-B11 (1987)
- The Abundance of H_2^+ Ions in Dense Interstellar Clouds. *S. Lepp, A. Dalgarno, and A. Sternberg*. **321**, 383, 126-D4 (1987)
- STEVENSON, D. J. Hydromagnetic Constraints on Deep Zonal Flow in the Giant Planets. *R. L. Kirk and D. J. Stevenson*. **316**, 836, 61-C4 (1987)
- STEWART, A. I. Solar Cycle Study of Interplanetary Lyman-Alpha Variations: PIONEER VENUS Orbiter Sky Background Results. *J. M. Ajello, A. I. Stewart, G. E. Thomas, and A. Graps*. **317**, 964, 76-F5 (1987)
- STEWART, GLEN R. The Role of Orbital Dynamics and Cloud-Cloud Collisions in the Formation of Giant Molecular Clouds in Global Spiral Structures. *William W. Roberts, Jr. and Glen R. Stewart*. **314**, 10, 28-B4 (1987)
- STINEBRING, DANIEL R. Improved Timing of the Millisecond Pulsar PSR 1937 + 21 Using Real-Time Coherent Dedispersion. *T. H. Hankins, Daniel R. Stinebring, and Lloyd A. Rawley*. **315**, 149, 41-F1 (1987)
- ST-LOUIS, NICOLE. Polarization Variability among Wolf-Rayet Stars. I. Linear Polarization of a Complete Sample of Southern Galactic WC Stars. *Nicole St-Louis, Laurent Drissen, Anthony F. J. Moffat, Pierre Bastien, and Santiago Tapia*. **322**, 870, 149-C13 (1987)
- Polarization Variability among Wolf-Rayet Stars. II. Linear Polarization as a Complete Sample of Southern Galactic WN Stars. *Laurent Drissen, Nicole St-Louis, Anthony F. J. Moffat, and Pierre Bastien*. **322**, 888, 149-E5 (1987)
- STOCKE, J. T. 1E 0116.3 – 0116: A Peculiar, X-Ray-Bright, Early-Type Galaxy. *D. Maccagni, I. M. Gioia, T. Maccacaro, R. E. Schild, and J. T. Stocke*. **316**, 132, 51-D6 (1987)
- STOCKE, JOHN. 1E 1048.5 + 5421: A New 114 Minute AM Herculis Binary. *Simon L. Morris, Gary D. Schmidt, James Liebert, John Stocke, Isabella M. Gioia, and Tommaso Maccacaro*. **314**, 641, 36-E8 (1987)
- STOCKE, JOHN T. X-Ray-Selected AGNs near Bright Galaxies. *John T. Stocke, Peter Schneider, Simon L. Morris, Isabella M. Gioia, Tommaso Maccacaro, and Rudolph E. Schild*. **315**, L11, 45-A14 (1987)
- B2 0800 + 24: A Narrow-Angle Tail Radio Galaxy in a Small Group of Galaxies. *John T. Stocke and Jack O. Burns*. **319**, 671, 102-C8 (1987)
- STOCKTON, ALAN. Extended Emission-Line Regions around QSOs. *Alan Stockton and John W. MacKenzie*. **316**, 584, 58-D3 (1987)
- STONE, J. L. see SYOBODA, R. et al.
- STONE, REMINGTON P. S. Spectroscopy and Photometry of Elliptical Galaxies. III. UVB Aperture Photometry, CCD Photometry, and Magnitude-related Parameters. *David Burstein, Roger L. Davies, Alan Dressler, S. M. Faber, Remington P. S. Stone, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner*. **64**, 601, 26-C7 (1987) (Abstr. in **318**, 944, 91-C9)
- STORCHI-BERGMANN, T. Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. *V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storchi-Bergmann, and J. Matthews*. **320**, 589, 116-B3 (1987)
- STOREY, J. W. V. Far-Infrared Measurements of N/O in H II Regions: Evidence for Enhanced CN Process Nucleosynthesis in the Inner Galaxy. *D. F. Lester, H. L. Dinerstein, M. W. Werner, D. M. Watson, R. Genzel, and J. W. V. Storey*. **320**, 573, 116-A1 (1987)
- Molecular Hydrogen Line Emission in Seyfert Galactic Nuclei. *J. Fischer, T. R. Geballe, Howard A. Smith, M. Simon, and J. W. V. Storey*. **320**, 667, 117-B2 (1987)

- STOTHERS, RICHARD B. Second-Overtone Models of RR Lyrae Stars. *Richard B. Stothers*. **319**, 260, 95-G5 (1987)
- STRATTON, B. C. A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. *M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengtson, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan*. **313**, 920, 26-G3 (1987)
- Laboratory Study of the Spectrum of Highly Ionized Calcium in the 100–250 Å Range Applied to Solar Flare Diagnostics. *S. Lippmann, M. Finkenthal, L. K. Huang, H. W. Moos, B. C. Stratton, T. L. Yu, A. K. Bhatia, and W. L. Hodge*. **316**, 819, 61-A11 (1987)
- STRAUSS, MICHAEL A. Extended Lyman- α Emission in 3C 326.1: A 100 Kiloparsec Cloud of Ionized Gas at a Redshift of 1.82. *Patrick J. McCarthy, Hyron Spinrad, S. Djorgovski, Michael A. Strauss, Wil van Breugel, and James Liebert*. **319**, L39, 107-B2 (1987)
- Cosmological Parameters from the IRAS Galaxy Sample. *Jens Verner Villumsen and Michael A. Strauss*. **322**, 37, 138-D1 (1987)
- STRAW, S. M. A Near-Infrared Study of the NGC 6334-IV Region. *P. M. Harvey, A. R. Hyland, and S. M. Straw*. **317**, 173, 65-G8 (1987)
- STRAW, STEVEN. An Active Star Formation Site in RCW 108. *Steven Straw, A. R. Hyland, Terry J. Jones, Paul M. Harvey, Bruce A. Wilking, and Marshall Joy*. **314**, 283, 31-B12 (1987)
- STRITTMATTER, P. A. Synchrotron Emission from Shock Waves in Active Galactic Nuclei. *P. L. Biermann and P. A. Strittmatter*. **322**, 643, 146-G5 (1987)
- STROBEL, D. F. Detection of Neutral Oxygen and Sulfur Emissions near IUE. *G. E. Ballester, H. W. Moos, P. D. Feldman, D. F. Strobel, M. E. Summers, J.-L. Bertaux, T. E. Skinner, M. C. Festou, and J. H. Lieske*. **319**, L33, 100-D1 (1987)
- STROM, K. M. High-Resolution Images of the L1551 Bipolar Outflow: Evidence for an Expanding, Accelerated Shell. *G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, F. P. Schloerb, K. M. Strom, and G. L. Grasdale*. **319**, 742, 103-B6 (1987)
- STROM, KAREN M. Forbidden Line and H α Profiles in T Tauri Star Spectra: A Probe of Anisotropic Mass Outflows and Circumstellar Disks. *Suzan Edwards, Sylvie Cabrit, Stephen E. Strom, Ingeborg Heyer, Karen M. Strom, and E. Anderson*. **321**, 473, 127-C10 (1987)
- The Magnetic Evolution of the Taurus Molecular Clouds. I. Large-scale Properties. *Mark H. Heyer, Frederick J. Vrba, Ronald L. Snell, F. P. Schloerb, Stephen E. Strom, Paul F. Goldsmith, and Karen M. Strom*. **321**, 855, 133-G9 (1987)
- STROM, R. G. 1928 + 738: A Superluminal Source with Large-Scale Structure. *K. J. Johnston, R. S. Simon, A. Eckart, P. Biermann, C. Schalinski, A. Witzel, and R. G. Strom*. **313**, L85, 27-D11 (1987)
- STROM, RICHARD G. Pulsar-like Emission from the Supernova Remnant CTB 80. *Richard G. Strom*. **319**, L103, 107-F13 (1987)
- STROM, S. E. CS Observations of L1551: No Rotating Disk. *G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, and G. L. Grasdale*. **317**, L95, 78-D13 (1987)
- High-Resolution Images of the L1551 Bipolar Outflow: Evidence for an Expanding, Accelerated Shell. *G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, F. P. Schloerb, K. M. Strom, and G. L. Grasdale*. **319**, 742, 103-B6 (1987)
- STROM, STEPHEN E. Forbidden Line and H α Profiles in T Tauri Star Spectra: A Probe of Anisotropic Mass Outflows and Circumstellar Disks. *Suzan Edwards, Sylvie Cabrit, Stephen E. Strom, Ingeborg Heyer, Karen M. Strom, and E. Anderson*. **321**, 473, 127-C10 (1987)
- The Magnetic Evolution of the Taurus Molecular Clouds. I. Large-scale Properties. *Mark H. Heyer, Frederick J. Vrba, Ronald L. Snell, F. P. Schloerb, Stephen E. Strom, Paul F. Goldsmith, and Karen M. Strom*. **321**, 855, 133-G9 (1987)
- STRONG, KEITH T. Simultaneous SMM Flat Crystal Spectrometer and Very Large Array Observations of Solar Active Regions. *Kenneth R. Lang, Robert F. Willson, Kermit L. Smith, and Keith T. Strong*. **322**, 1035, 151-C4 (1987)
- Solar Active Region Physical Parameters Inferred from a Thermal Cyclotron Line and Soft X-Ray Spectral Lines. *Kenneth R. Lang, Robert F. Willson, Kermit L. Smith, and Keith T. Strong*. **322**, 1044, 151-D3 (1987)
- STRUBLE, MITCHELL F. Alignment Statistics of Clusters with Their Brightest Members at Bright and Faint Isophotes. *Mitchell F. Struble*. **317**, 668, 73-D2 (1987)
- Results from a Visual Survey of All 2712 Abell Clusters. *Mitchell F. Struble and Herbert J. Rood*. **323**, 468, 159-F4 (1987)
- A Compilation of Redshifts and Velocity Dispersions for Abell Clusters. *Mitchell F. Struble and Herbert J. Rood*. **63**, 543, 9-C7 (1987) (Abstr. in **313**, 928, 26-G11)
- A Catalog of Morphological Properties of the 2712 Abell Clusters. *Mitchell F. Struble and Herbert J. Rood*. **63**, 555, 9-D4 (1987) (Abstr. in **313**, 929, 26-G12)
- STRUCK-MARCELL, CURTIS. Star Formation Rates in Ring Galaxies from IRAS Observations. *P. N. Appleton and Curtis Struck-Marcell*. **312**, 566, 9-A12 (1987)
- Models of Ring Galaxies. I. The Growth and Disruption of Clouds in the Expanding Density Wave. *P. N. Appleton and Curtis Struck-Marcell*. **318**, 103, 80-A14 (1987)
- Models of Ring Galaxies. II. Extended Starbursts. *Curtis Struck-Marcell and P. N. Appleton*. **323**, 480, 159-G5 (1987)
- Continuum Models for Gas in Disturbed Galaxies. III. Bifurcations and Chaos in a Deterministic Model for Bursts of Star Formation. *Curtis Struck-Marcell and John M. Scalo*. **64**, 39, 17-D11 (1987) (Abstr. in **315**, 730, 48-E11)
- STUTZKI, J. Aperture Synthesis Observations of the Circumnuclear Ring in the Galactic Center. *R. Güsten, R. Genzel, M. C. H. Wright, D. T. Jaffe, J. Stutzki, and A. I. Harris*. **318**, 124, 80-C8 (1987)
- Submillimeter and Far-Infrared Spectroscopy of M17 and S106: UV-Heated, Quiescent Molecular Gas? *A. I. Harris, J. Stutzki, R. Genzel, J. B. Lugten, G. J. Stacey, and D. T. Jaffe*. **322**, L49, 145-D6 (1987)
- SUBRAMANIAN, K. The Gravitational Lens System 2016 + 112 Revisited. *D. Narasimha, K. Subramanian, and S. M. Chitre*. **315**, 434, 45-D11 (1987)
- SUBRAMANIAN, KANDASWAMY. The Intensity Ratio in Different Wave Bands between Images of Gravitationally Lensed Quasars as a Probe of Dark Matter. *Kandaswamy Subramanian and S. M. Chitre*. **313**, 13, 15-B5 (1987)
- SUESS, S. T. Radiatively Driven Winds from Magnetic, Fast-rotating Stars: Wolf-Rayet Stars? *Steven Nerney and S. T. Suess*. **321**, 355, 126-B3 (1987)
- SULAK, L. see SVOBODA, R. et al.
- SULENTIC, JACK W. The Galaxy-Quasar Connection: NGC 4319 and Markarian 205. I. Direct Imagery. *Jack W. Sulentic and Halton Arp*. **319**, 687, 102-D12 (1987)
- The Galaxy-Quasar Connection: NGC 4319 and Markarian 205. II. Spectroscopy. *Jack W. Sulentic and Halton Arp*. **319**, 693, 102-E10 (1987)
- Properties of Dense Galaxy Groups and the Implications of Their Existence. *Jack W. Sulentic*. **322**, 605, 146-D7 (1987)
- SULKANEN, M. E. Self-collimated Electromagnetic Jets from Magnetized Accretion Disks. *R. V. E. Lovelace, J. C. L. Wang, and M. E. Sulkane*. **315**, 504, 46-C1 (1987)
- SUMMERS, M. E. Detection of Neutral Oxygen and Sulfur Emissions near IUE. *G. E. Ballester, H. W. Moos, P. D. Feldman, D. F. Strobel, M. E. Summers, J.-L. Bertaux, T. E. Skinner, M. C. Festou, and J. H. Lieske*. **319**, L33, 100-D1 (1987)
- SUN, WEI-HSIN. Magnetic Field Measurements on the Sun and Implications for Stellar Magnetic Field Observations. *Wei-Hsin Sun, Mark S. Giampapa, and Simon P. Worden*. **312**, 930, 13-B1 (1987)
- SUNTZEFF, N. B. Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. *V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storchi-Bergmann, and J. Matthews*. **320**, 589, 116-B3 (1987)
- SUNYAEV, R. A. Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. *J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Koweliotou, T. Cline, B. Dennis, U. Desai, and L. Orwig*. **320**, L105, 121-C7 (1987)
- A New Type of Repetitive Behavior in a High-Energy Transient. *J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Koweliotou, T. L. Cline, B. R. Dennis, U. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. **320**, L111, 121-C13 (1987)
- SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806 – 20. *C. Koweliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. **322**, L21, 145-B8 (1987)
- SUTHERLAND, PETER. Inside Supernova 1987A. *Richard McCray, J. Michael Shull, and Peter Sutherland*. **317**, L73, 78-C7 (1987)
- SUTHERLAND, PETER G. Models for Type Ia Supernovae with Composition Inversions. *J. Craig Wheeler, Douglas Swartz, Zong-wei Li, and Peter G. Sutherland*. **316**, 733, 60-B5 (1987)
- SUTIN, BRIAN. Collisional Charging of Interstellar Grains. *B. T. Draine and Brian Sutin*. **320**, 803, 118-E5 (1987)
- SUTO, YASUSHI. Correlation Function in Decaying Particle Cosmology. *Yasushi Suto*. **321**, 36, 122-D12 (1987)
- Small-scale Anisotropies in the Microwave Background in a Baryon-dominated Open Universe. *Naoteru Gouda, Misao Sasaki, and Yasushi*

- SUTO, 321, L1, 129-B4 (1987)
- SUTTON, E. C. Molecular Abundances in OMC-1: The Chemical Composition of Interstellar Molecular Clouds and the Influence of Massive Star Formation. *Geoffrey A. Blake, E. C. Sutton, C. R. Masson, and T. G. Phillips*. 315, 621, 47-D9 (1987)
- SUTTON, S. A Radio Survey of Symbiotic Stars: Erratum. *E. R. Seaquist, A. R. Taylor, and S. Sutton*. 317, 555, 70-A5 (1987) (Orig. paper in 284, 202, 100-C7)
- SUZUKI, HIROKO. Detection of Intense Unidentified Lines in TMC-1. *Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito*. 317, L111, 78-E14 (1987)
- Laboratory Detection and Astronomical Identification of a New Free Radical, $\text{CCS}^+(\Sigma^-)$. *Shuji Saito, Kentarou Kawaguchi, Satoshi Yamamoto, Masatoshi Ohishi, Hiroko Suzuki, and Norio Kaifu*. 317, L115, 78-F3 (1987)
- Laboratory Detection of a New Carbon-Chain Molecule C_3S and Its Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, Kentarou Kawaguchi, Norio Kaifu, Hiroko Suzuki, and Masatoshi Ohishi*. 317, L119, 78-F7 (1987)
- Fluorescent Molecular Hydrogen Emission from the Reflection Nebula NGC 2023. *Ian Gatley, Tetsuo Hasegawa, Hiroko Suzuki, Ron Garner, Peter Brand, John Lightfoot, William Glencross, Haruyuki Okuda, and Tetsuya Nagata*. 318, L73, 92-D4 (1987)
- Laboratory and Astronomical Detection of the Cyclic H_3H Radical. *Satoshi Yamamoto, Shuji Saito, Masatoshi Ohishi, Hiroko Suzuki, Shin-ichi Ishikawa, Norio Kaifu, and Akinori Murakami*. 322, L55, 145-D12 (1987)
- Laboratory Microwave Spectroscopy of the Vibrational Satellites for the ν_7 and $2\nu_7$ States of C_2H and Their Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, M. Guélin, J. Cernicharo, Hiroko Suzuki, and Masatoshi Ohishi*. 323, L149, 164-E8 (1987)
- SVOBODA, R., et al. An Upper Limit on the Flux of Extraterrestrial Neutrinos. *R. Svoboda, R. M. Bionta, G. Blewitt, C. B. Bratton, D. Casper, P. Chrysicopoulou, A. Cioico, R. Claus, B. Cortez, S. T. Dye, S. Errede, G. W. Foster, W. Gajewski, K. S. Ganezer, M. Goldhaber, T. J. Haines, T. W. Jones, D. Kielczewska, W. R. Kropp, J. G. Learned, J. M. LoSecco, J. Matthews, H. S. Park, F. Reines, J. Schultz, S. Seidel, E. Shumard, D. Sinclair, H. W. Sobel, J. L. Stone, L. Sulak, G. Thornton, J. C. van der Velde, and C. Wuest*. 315, 420, 45-C10 (1987)
- SWARTZ, DOUGLAS. Models for Type Ia Supernovae with Composition Inversions. *J. Craig Wheeler, Douglas Swartz, Zong-wei Li, and Peter G. Sutherland*. 316, 733, 60-B5 (1987)
- SWEETNAM, DONALD N. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. *John D. Anderson, Timothy P. Krisher, Susan E. Borutski, Michael J. Connally, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen*. 323, L141, 164-E1 (1987)
- SWEIGART, ALLEN V. On the Interpretation of the Sandage Period-Shift Effect among Globular Cluster RR Lyrae Variables. *Allen V. Sweigart, Alvio Renzini, and Amedeo Tormambè*. 312, 762, 11-C4 (1987)
- Evolutionary Sequences for Horizontal-Branch Stars. *Allen V. Sweigart*. 65, 95, 29-A1 (1987) (Abstr. in 319, 1012, 106-A10)
- SWINDLE, T. D. Evidence in Meteorites for an Active Early Sun. *M. W. Caffee, C. M. Hohenberg, T. D. Swindle, and J. N. Goswami*. 313, L31, 21-C3 (1987)
- SWINGS, J. P. Extinction and Abundance Properties of Alpha Scorpii Circumstellar Grains. *Theodore P. Snow, Jr., Richard H. Buss, Jr., D. P. Gilra, and J. P. Swings*. 321, 921, 134-E13 (1987)
- SYGNET, J. F. Nonlinear Coupling of Galactic Spiral Modes. *M. Tagger, J. F. Sygnet, E. Athanassoula, and R. Pellat*. 318, L43, 92-B4 (1987)
- SZALAY, ALEXANDER. Primeval Galaxies and Cold Dark Matter. *Joseph Silk and Alexander Szalay*. 323, L107, 164-B4 (1987)
- SZKODY, PAULA. Photometry and Spectroscopy of Short-Period Cataclysmic Variables. *Paula Szkody*. 63, 685, 11-B3 (1987) (Abstr. in 313, 930, 26-G13)
- SZTAJNO, M. Correlation between Spectral State and Quasi-periodic Oscillation Parameters in GX 5-1. *M. van der Klis, F. Jansen, J. van Paradijs, W. H. G. Lewin, M. Sztajno, and J. Trümper*. 313, L19, 21-B7 (1987)
- EXOSAT Observations of 4U/MXB 1636 - 53: On the Relation between the Amount of Accreted Fuel and the Strength of an X-Ray Burst. *W. H. G. Lewin, W. Penninx, J. van Paradijs, E. Damen, M. Sztajno, J. Trümper, and M. van der Klis*. 319, 893, 104-F9 (1987)
- EXOSAT Observations of 4U 1705 - 44: Type I Bursts and Persistent Emission. *A. Langmeier, M. Sztajno, G. Hasinger, J. Trümper, and M. Gottwald*. 323, 288, 156-B13 (1987)
- SZTAJNO, MIREK. On the Theory of Type I X-Ray Bursts. The Energetics of Bursts and the Nuclear Fuel Reservoir in the Envelope. *Masayuki Y. Fujimoto, Mirek Sztajno, Walter H. G. Lewin, and Jan van Paradijs*. 319, 902, 104-G5 (1987)
- SZYMOWIAK, ANDREW. IRAS Observations of Supernova Remnants: A Comparison between Their Infrared and X-Ray Cooling Rates. *Eli Dwek, Robert Petre, Andrew Szymowiak, and Walter L. Rice*. 320, 27, 114-C4 (1987)
- TAAAM, RONALD E. Numerical Simulations of Adiabatic Axisymmetric Accretion Flow. I. A New Mechanism for the Formation of Jets. *B. A. Fryxell, Ronald E. Taam, and S. L. W. McMillan*. 315, 536, 46-E5 (1987)
- The Formation and Evolution of Tidal Binary Systems. *Stephen L. W. McMillan, P. N. McDermott, and Ronald E. Taam*. 318, 261, 81-F11 (1987)
- Nonradial g-Mode Oscillations in X-Ray Bursting Neutron Stars. *P. N. McDermott and Ronald E. Taam*. 318, 278, 82-A1 (1987)
- A Dynamical Instability Model for the Period Gap of Cataclysmic Variable Binary Systems. *Ronald E. Taam and P. N. McDermott*. 319, L83, 107-E8 (1987)
- The Spectra of Accretion Disks and Their Application to Low-Mass X-Ray Binaries. *Ronald E. Taam and P. Mészáros*. 322, 329, 141-D6 (1987)
- TABARA, H. see MAKINO, F., et al.
- TACCONI, LINDA J. The CO Contents of Dwarf Irregular Galaxies. *Linda J. Tacconi and Judith S. Young*. 322, 681, 147-C1 (1987)
- TAGGER, M. Nonlinear Coupling of Galactic Spiral Modes. *M. Tagger, J. F. Sygnet, E. Athanassoula, and R. Pellat*. 318, L43, 92-B4 (1987)
- TAJIMA, T. Reconnection-driven Oscillations in Dwarf Novae Disks. *T. Tajima and D. Gilden*. 320, 741, 117-G10 (1987)
- Current Loop Coalescence Model of Solar Flares. *T. Tajima, J. Sakai, H. Nakajima, T. Kosugi, F. Brunel, and M. R. Kundu*. 321, 1031, 135-F11 (1987)
- Energy Buildup in Coronal Magnetic Flux Tubes. *R. S. Steinolfson and T. Tajima*. 322, 503, 143-D10 (1987)
- TAKADA-HIDAI, MASAHIKE. The Abundance of Gallium in B-Type Chemically Peculiar Stars: Addendum. *Masahide Takada-Hidai, Kozo Sadakane, and Jun Jugaku*. 320, 437, 112-G4 (1987) (Orig. paper in 304, 425, 58-D14)
- TAKAHARA, F. see MAKINO, F., et al.
- TAKAYANAGI, K. Para/Ortho Abundance Ratio of Molecular Hydrogen in NGC 2023. *K. Takayanagi, K. Sakimoto, and K. Onda*. 318, L81, 92-E2 (1987)
- TALIN, B. Partial Redistribution in High-Density, Highly Ionized Plasmas. *B. Talin, R. Stamm, V. P. Kaftandjian, and Lewis Klein*. 322, 804, 148-E12 (1987)
- TALON, R. Short Solar Events with Evidence of Repetitive Structures. *Upendra D. Desai, Chryssa Kouveliotou, C. Barat, K. Hurley, M. Niel, R. Talon, G. Vedrenne, I. V. Estulin, and V. Ch. Dolidze*. 319, 567, 99-E1 (1987)
- TANABÉ, T. Water Maser Emission toward V788 Cygni, A Carbon Star. *Y. Nakada, H. Izumiura, T. Onaka, O. Hashimoto, N. Ukita, S. Deguchi, and T. Tanabé*. 323, L77, 158-F6 (1987)
- TANAKA, K. Transient Ionization and Solar Flare X-Ray Spectra. *G. A. Doschek and K. Tanaka*. 323, 799, 163-E1 (1987)
- TANAKA, Y. see MAKINO, F., et al.
- TANANBAUM, H. X-Ray Studies of Quasars with the EINSTEIN OBSERVATORY. IV. X-Ray Dependence on Radio Emission. *D. M. Worrall, P. Giommi, H. Tananbaum, and G. Zamorani*. 313, 596, 23-C9 (1987)
- TANG, KWOK-KWONG. Cosmic-Ray Positrons from 10 to 20 GeV: A Balloon-borne Measurement Using the Geomagnetic East-West Asymmetry. *Dietrich Müller and Kwok-kwong Tang*. 312, 183, 3-A4 (1987)
- TANIGUCHI, YOSHIKI. NGC 3928: A Highly Bulge-dominated Compact Spiral Galaxy. *Yoshiaki Taniguchi and Masaaki Watanabe*. 313, 89, 16-A5 (1987)
- Blueward Asymmetrical Emission-Line Profiles of a Starburst-Nucleus Galaxy Markarian 52. *Yoshiaki Taniguchi*. 317, L57, 78-B6 (1987)
- TANZI, E. G. The Redshift of the BL Lacertae Object PKS 2005-489. *R. Falomo, L. Maraschi, E. G. Tanzi, and A. Treves*. 318, L39, 92-B1 (1987)
- TAPIA, SANTIAGO. Polarization Variability among Wolf-Rayet Stars. I. Linear Polarization of a Complete Sample of Southern Galactic WC Stars. *Nicole St-Louis, Laurent Drissen, Anthony F. J. Moffat, Pierre Bastien, and Santiago Tapia*. 322, 870, 149-C13 (1987)
- TARAFDAR, S. P. Effect of Balmer Continuum Absorption on Line Emission from Be Stars. *Krishna M. V. Apparao and S. P. Tarafdar*. 322, 976, 150-E7 (1987)

- OH and CH Continuous Opacity in Solar and Stellar Atmospheres. Robert L. Kurucz, Ewine F. van Dishoeck, and S. P. Tarafdar. **322**, 992, 150-F13 (1987)
- TARBELL, T. D. On the Relation between Magnetic Field Structures and Granulation. A. M. Title, T. D. Tarbell, and K. P. Topka. **317**, 892, 75-G3 (1987)
- TASSOUL, JEAN-LOUIS. On Synchronization in Early-Type Binaries. Jean-Louis Tassoul. **322**, 856, 149-B12 (1987)
- TASSOUL, M. Asymptotic Approximations for Higher Order Nonradial Oscillations of a Spherically Symmetric Star. P. Smeyers and M. Tassoul. **65**, 429, 34-B11 (1987) (Abstr. in **321**, 1051, 136-A2)
- TAYAL, S. S. Effective Collision Strengths for Electron Impact Excitation in S II. S. S. Tayal, J. W. Henry, and S. Nakazaki. **313**, 487, 20-C10 (1987)
- Electron Excitation of Fine-Structure Transitions within the Ground $3s^2 3p^3$ Configuration in Fe XII. S. S. Tayal, Ronald J. W. Henry, and A. K. Pradhan. **319**, 951, 105-C13 (1987)
- TAYLOR, A. R. A Detailed Analysis of the Radio Emission from the Symbiotic Star RX Puppis. E. R. Seaquist and A. R. Taylor. **312**, 813, 11-G1 (1987)
- Evidence for Ram Pressure Stripping of NGC 3073 by Outflowing Gas from NGC 3079. Judith A. Irwin, E. R. Seaquist, A. R. Taylor, and N. Duric. **313**, L91, 27-E3 (1987)
- A Radio Survey of Symbiotic Stars: Erratum. E. R. Seaquist, A. R. Taylor, and S. Sutton. **317**, 555, 70-A5 (1987) (Orig. paper in **284**, 202, 100-C7)
- TAYLOR, ANTHONY H. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. John D. Anderson, Timothy P. Krisher, Susan E. Borutski, Michael J. Connally, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine J. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen. **323**, L141, 164-E1 (1987)
- TAYLOR, BENJAMIN J. The "Alternative X" Question: What Causes the Strong Molecular Bands and Damping Lines in the Very Strong Lined (Super-Metal-rich) Stars? Benjamin J. Taylor and Scott B. Johnson. **322**, 930, 150-B2 (1987)
- DDO, Cousins $R - I$, and Photomultiplier Scanner Data for an Analysis of Very Strong Lined K Giants. Scott B. Johnson, Michael D. Joner, and Benjamin J. Taylor. **63**, 983, 16-B1 (1987) (Abstr. in **314**, 833, 38-F9)
- TAYLOR, DAVID K. Molecular Clouds and the Gould Belt. David K. Taylor, R. L. Dickman, and N. Z. Scoville. **315**, 104, 41-B2 (1987)
- TEEGARDEN, B. J. Gamma-Ray Burster Counterparts: Infrared. Bradley E. Schaefer, T. L. Cline, U. Desai, B. J. Teggarden, J.-L. Atteia, C. Barat, K. Hurley, M. Niel, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, I. V. Estulin, and A. V. Kuznetsov. **313**, 226, 17-D9 (1987)
- TEGLER, STEPHEN C. Spectrophotometry of Comets Giacobini-Zinner and Halley. Stephen C. Tegner and C. R. O'Dell. **317**, 987, 77-A2 (1987)
- TEKEUCHI, HIDEO. Viscosity of Dense Matter. Naoki Itoh, Yasuharu Kohyama, and Hideo Tekeuchi. **317**, 733, 74-A13 (1987)
- TELESCO, C. M. Star Formation in the Magellanic Irregular Galaxy NGC 4449. Harley A. Thomson, Jr., Deidre A. Hunter, C. M. Telesco, D. A. Harper, and R. Decher. **317**, 180, 66-A3 (1987)
- TENNANT, ALLYN. Simultaneous Multifrequency Observations of Markarian 421. Jean Brodie, Stuart Bowyer, and Allyn Tennant. **318**, 175, 80-G5 (1987)
- TEREKHOV, O. V. Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Koweliotou, T. Cline, B. Dennis, U. Desai, and L. Orwig. **320**, L105, 121-C7 (1987)
- A New Type of Repetitive Behavior in a High-Energy Transient. J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Koweliotou, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov. **320**, L111, 121-C13 (1987)
- SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806 - 20. C. Koweliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov. **322**, L21, 145-B8 (1987)
- TERLEVICH, R. J. Spectroscopy and Photometry of Elliptical Galaxies: A Large-Scale Streaming Motion in the Local Universe. Alan Dressler, S. M. Faber, David Burstein, Roger L. Davies, Donald Lynden-Bell, R. J. Terlevich, and Gary Wegner. **313**, L37, 27-A9 (1987)
- TERLEVICH, ROBERTO. Spectroscopy and Photometry of Elliptical Galaxies. I. New Distance Estimator. Alan Dressler, Donald Lynden-Bell, David Burstein, Roger L. Davies, S. M. Faber, Roberto Terlevich, and Gary Wegner. **313**, 42, 15-D7 (1987)
- TERLEVICH, ROBERTO J. Spectroscopy and Photometry of Elliptical Galaxies. II. The Spectroscopic Parameters. Roger L. Davies, David Burstein, Alan Dressler, S. M. Faber, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner. **64**, 581, 26-B1 (1987) (Abstr. in **318**, 944, 91-C9)
- Spectroscopy and Photometry of Elliptical Galaxies. III. *UBV* Aperture Photometry, CCD Photometry, and Magnitude-related Parameters. David Burstein, Roger L. Davies, Alan Dressler, S. M. Faber, Remington P. S. Stone, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner. **64**, 601, 26-C7 (1987) (Abstr. in **318**, 944, 91-C9)
- TERNDROP, D. M. Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storchi-Bergmann, and J. Matthews. **320**, 589, 116-B3 (1987)
- TERNDROP, DON. Infrared Photometry and Spectroscopy of Supernova 1986g in NGC 5128-Centaurus A. Jay A. Frogel, Brooke Gregory, Kimiaki Kawara, Dave Laney, M. M. Phillips, Don Terndrup, Frederick Vrba, and Albert E. Whitford. **315**, L129, 49-E11 (1987)
- TESKE, RICHARD G. Forbidden Coronal Iron Line Images of Puppis A: Cloud Evaporation or Shocked Cloud? Richard G. Teske and Robert Petre. **314**, 673, 37-A2 (1987)
- Forbidden Coronal Iron-Line Emission in the Puppis A Shock Front: The Effect of Inhomogeneities. Richard G. Teske and Robert Petre. **318**, 370, 83-A1 (1987)
- TEUKOLSKY, SAUL A. Simulations of Axisymmetric, Newtonian Star Clusters: Prelude to 2 + 1 General Relativistic Computations. Stuart L. Shapiro and Saul A. Teukolsky. **318**, 542, 86-G1 (1987)
- How Big Are Supermassive Black Holes Formed from the Collapse of Dense Star Clusters? Christopher S. Kochanek, Stuart L. Shapiro, and Saul A. Teukolsky. **320**, 73, 108-G8 (1987)
- THADDEUS, P. A Large Molecular Cloud in Lupus Far From the Galactic Plane. L.-A. Nyman, P. Thaddeus, L. Bronfman, and R. S. Cohen. **314**, 374, 32-C4 (1987)
- Laboratory and Astronomical Spectroscopy of C_2H_2 , the First Interstellar Organic Ring. J. M. Vrtilik, C. A. Gottlieb, and P. Thaddeus. **314**, 716, 37-D8 (1987)
- Molecular Clouds in the Carina Arm: Large-Scale Properties of Molecular Gas and Comparison with H I. D. A. Grabelsky, R. S. Cohen, L. Bronfman, P. Thaddeus, and J. May. **315**, 122, 41-D2 (1987)
- The Radio Spectrum of Cyclopropene. J. M. Vrtilik, C. A. Gottlieb, T. J. LePage, and P. Thaddeus. **316**, 826, 61-B4 (1987)
- A Composite CO Survey of the Entire Milky Way. T. M. Dame, H. Ungerechts, R. S. Cohen, E. J. de Geus, I. A. Grenier, J. May, D. C. Murphy, L.-A. Nyman, and P. Thaddeus. **322**, 706, 147-D13 (1987)
- A CO Survey of the Dark Nebulae in Perseus, Taurus, and Auriga. H. Ungerechts and P. Thaddeus. **63**, 645, 10-D6 (1987) (Abstr. in **313**, 930, 26-G13)
- THADDEUS, PATRICK. Molecular and Atomic Clouds Associated with Infrared Cirrus in Ursa Major. Hendrik Willem de Vries, Andreas Heithausen, and Patrick Thaddeus. **319**, 123, 103-A1 (1987)
- THIELEMANN, F.-K. Nuclear Chronometers from the r -Process and the Age of the Galaxy. John J. Cowan, F.-K. Thielemann, and J. W. Truran. **323**, 543, 160-F1 (1987)
- THIELEMANN, FRIEDRICH-KARL. Chemical Evolution, Stellar Nucleosynthesis, and A Variable Star Formation Rate. Keith A. Olive, Friedrich-Karl Thielemann, and James W. Truran. **313**, 813, 25-F1 (1987)
- Alpha-Burning of ^{14}O . Michael Wiescher, Volker Harms, Joachim Görres, Friedrich-Karl Thielemann, and Lawrence J. Rybarczyk. **316**, 162, 51-F10 (1987)
- The Production of ^{26}Al in Supermassive Stars and the Gamma-Ray Line Flux from the Galactic Center. Wolfgang Hillebrandt, Friedrich-Karl Thielemann, and Norbert Langer. **321**, 761, 132-G7 (1987)
- THOMAS, G. E. Solar Cycle Study of Interplanetary Lyman-Alpha Variations: PIONEER VENUS Orbiter Sky Background Results. J. M. Ajello, A. I. Stewart, G. E. Thomas, and A. Graps. **317**, 964, 76-F5 (1987)
- THOMAS, JOHN H. Simultaneous Measurements of Sunspot Umbral Oscillations in the Photosphere, Chromosphere, and Transition Region. John H. Thomas, Bruce W. Lites, Joseph B. Gurman, and Edwin F. Ladd. **312**, 457, 5-G9 (1987)
- The Interaction of Solar p -Modes with a Sunspot. II. Simple Theoretical Models. Toufik E. Abdelatif and John H. Thomas. **320**, 884, 119-D11 (1987)
- THOMPSON, C. Distortion of the Cosmic Background Radiation by Superconducting Strings. J. P. Ostriker and C. Thompson. **323**, L97,

- 164-A9 (1987)
- THOMPSON, D. J. Reexamination of the SAS 2 Cygnus X-3 Data. *C. E. Fichtel, D. J. Thompson, and R. C. Lamb*. **319**, 362, 97-A9 (1987)
- THOMPSON, D. T. Spectrophotometry of Epsilon Aurigae. *D. T. Thompson, B. L. Lutz, G. W. Lockwood, and J. R. Sowell*. **321**, 450, 127-B1 (1987)
- The Activity, Variability, and Rotation of Lower Main-Sequence Hyades Stars. *Richard R. Radick, D. T. Thompson, G. W. Lockwood, D. K. Duncan, and W. E. Baggett*. **321**, 459, 127-B10 (1987)
- THOMPSON, I. B. CAL 83: A Puzzling X-Ray Source in the Large Magellanic Cloud. *David Crampton, A. P. Cowley, J. B. Hutchings, Paul C. Schmidtke, I. B. Thompson, and James Liebert*. **321**, 745, 132-F3 (1987)
- THOMPSON, IAN. The Stellar Populations of Shapley Constellation III. *Neill Reid, Jeremy Mould, and Ian Thompson*. **323**, 433, 159-C11 (1987)
- THOMPSON, IAN B. Magnetic Field Measurements of Helium-strong Stars. *David A. Bohlender, Douglas N. Brown, J. D. Landstreet, and Ian B. Thompson*. **323**, 325, 156-E8 (1987)
- The Evolution of the Magnetic Fields of Ap Stars: Magnetic Observations of Stars in the Scorpius-Centaurus Association. *Ian B. Thompson, Douglas N. Brown, and John D. Landstreet*. **64**, 219, 19-B11 (1987) (Abstr. in **315**, 732, 48-E13)
- THOMPSON, KEITH L. The Effect of Spherical Voids on the Microwave Background Radiation. *Keith L. Thompson and Ethan T. Vishniac*. **313**, 517, 22-D9 (1987)
- THOMPSON, LAIRD A. High-Resolution Imaging from Mauna Kea: Globular Clusters in the Coma Cluster Galaxy NGC 4874. *Laird A. Thompson and Francisco Valdes*. **315**, L35, 45-C14 (1987)
- THOMPSON, RODGER I. Line Excess in Low-Luminosity Young Stellar Objects. *Rodger I. Thompson*. **312**, 784, 11-D13 (1987)
- A New Ionization Model for Galaxies with Dominant Star-Formation Regions. *Rodger I. Thompson*. **321**, 153, 123-G11 (1987)
- THOMSEN, BJARNE. Magnesium Gradients in Elliptical Galaxies. II. NGC 4881. *Bjarne Thomsen and William A. Baum*. **315**, 460, 45-F10 (1987)
- THONNARD, N. H I Gas near the Giant Elliptical Galaxy NGC 4472. *R. Sancisi, N. Thonnard, and R. D. Ekers*. **315**, L39, 45-D8 (1987)
- THORNTON, G. see SVOBODA, R. et al.
- THORSTENSEN, JOHN R. A 9.3 Hour Orbital Period in the Potential Black Hole Binary 4U 1957 + 11. *John R. Thorstensen*. **312**, 739, 11-A9 (1987)
- THRONSON, HARLEY A., JR. Star Formation in the Magellanic Irregular Galaxy NGC 4449. *Harley A. Thronson, Jr., Deidre A. Hunter, C. M. Telesco, D. A. Harper, and R. Decher*. **317**, 180, 66-A3 (1987)
- Observations of 1.3 Millimeter Emission from the Centers of Galaxies. *Harley A. Thronson, Jr., Christopher K. Walker, Constance E. Walker, and Philip Maloney*. **318**, 645, 88-A4 (1987)
- Infrared Emission and Star Formation in Early-Type Galaxies. *Harley A. Thronson, Jr. and John Bally*. **319**, L63, 107-D1 (1987)
- Properties of Evolved Mass-losing Stars in the Milky Way and Variations in the Interstellar Dust Composition. *Harley A. Thronson, Jr., William B. Latter, John H. Black, John Bally, and Perry Hacking*. **322**, 770, 148-C5 (1987)
- THUAN, TRINH X. The Spatial Distribution of Dwarf Galaxies in the CfA Slice of the Universe. *Trinh X. Thuan, J. Richard Gott III, and Stephen E. Schneider*. **315**, L93, 49-C2 (1987)
- Spectral Synthesis in the Ultraviolet. I. Far-Ultraviolet Stellar Library. *Michael N. Fanelli, Robert W. O'Connell, and Trinh X. Thuan*. **321**, 768, 133-A1 (1987)
- Near-Infrared Observations of Submillijansky Radio Sources: Evidence for a Population of Starburst Galaxies at Intermediate Redshifts. *Trinh X. Thuan and J. J. Condon*. **322**, L9, 145-A11 (1987)
- TIELENS, A. G. G. M. Anharmonicity and the Interstellar Polycyclic Aromatic Hydrocarbon Infrared Emission Spectrum. *John R. Barker, L. J. Allamandola, and A. G. G. M. Tielens*. **315**, L61, 45-E14 (1987)
- The Structure of Time-dependent Interstellar Shocks and Grain Destruction in the Interstellar Medium. *Christopher F. McKee, David J. Hollenbach, C. Gregory Seab, and A. G. G. M. Tielens*. **318**, 674, 88-C7 (1987)
- Shock Processing of Interstellar Dust: Diamonds in the Sky. *A. G. G. M. Tielens, C. G. Seab, D. J. Hollenbach, and Christopher F. McKee*. **319**, L109, 107-G6 (1987)
- TIPPING, R. H. Vibration-Rotational Intensities for the $X^1\Sigma^+$ State of Al H and Al D. *R. H. Tipping, A. Lopez Piñeiro, and C. Chackerian, Jr.* **323**, 810, 163-E12 (1987)
- TITLE, A. M. On the Relation between Magnetic Field Structures and Granulation. *A. M. Title, T. D. Tarbell, and K. P. Topka*. **317**, 892, 75-G3 (1987)
- TOFFOLATTI, L. Interpretation of Deep Counts of Radio Sources. *L. Danese, G. De Zotti, A. Franceschini, and L. Toffolatti*. **318**, L15, 85-B2 (1987)
- TOHLINE, JOEL E. Linear and Nonlinear Dynamic Instability of Rotating Polytropes. *Harold A. Williams and Joel E. Tohline*. **315**, 594, 47-B10 (1987)
- Lower Bounds on the Masses of Rapidly Rotating White Dwarfs. *G. Channugam, Meenakshi Rao, and Joel E. Tohline*. **319**, 188, 95-A13 (1987)
- The Crucial Role of Cooling in the Making of Molecular Clouds and Stars. *Joel E. Tohline, Peter H. Bodenheimer, and Dimitris M. Christodoulou*. **322**, 787, 148-D9 (1987)
- Fragmentation of Rapidly Rotating Gas Clouds. I. A Universal Criterion for Fragmentation. *Izumi Hachisu, Joel E. Tohline, and Yoshiharu Eriguchi*. **323**, 592, 161-C1 (1987)
- TOKARZ, SUSAN. BE Ursae Majoris: A Detached Binary with a Unique Reprocessing Spectrum. *Donald H. Ferguson, James Liebert, Roc Cutri, Richard F. Green, S. P. Willner, João E. Steiner, and Susan Tokarz*. **316**, 399, 54-D4 (1987)
- TOKI, HIROSHI. Radiative Alpha-Capture Rates Leading to $A = 7$ Nuclei: Applications to the Solar Neutrino Problem and Big Bang Nucleosynthesis. *Toshitaka Kajino, Hiroshi Toki, and Sam M. Austin*. **319**, 531, 99-A12 (1987)
- TOKUNAGA, ALAN T. Infrared Spectrum of Quenched Carbonaceous Composite (QCC). II. A New Identification of the 7.7 and 8.6 Micron Unidentified Infrared Emission Bands. *Akira Sakata, Setsuko Wada, Takashi Onaka, and Alan T. Tokunaga*. **320**, L63, 114-E9 (1987)
- TOMIMURA, NAZIRA. Inhomogeneous Cosmological Models: New Exact Solutions with Dust, Isotropic Radiation, and Electromagnetic Field. *Nazira Tomimura and Ioav Waga*. **317**, 52, 64-E2 (1987)
- TONER, C. G. An Analysis of the Photospheric Line Profiles in F, G, and K Supergiants. *David F. Gray and C. G. Toner*. **322**, 360, 141-G1 (1987)
- TONRY, JOHN L. A Central Black Hole in M32. *John L. Tonry*. **322**, 932, 146-F7 (1987)
- TOPKA, K. P. On the Relation between Magnetic Field Structures and Granulation. *A. M. Title, T. D. Tarbell, and K. P. Topka*. **317**, 892, 75-G3 (1987)
- TORBETT, MICHAEL V. Radio Emission from the Nova-like Variable AC Cancri and the Symbiotic Variable AG Draconis. *Michael V. Torbett and Bel Campbell*. **318**, L29, 85-C2 (1987)
- TORNAMBÈ, A. Subluminous Type I Supernovae: Their Theoretical Rate in Our Galaxy and in Ellipticals. *A. Tornambè and F. Matteucci*. **318**, L25, 85-B12 (1987)
- TORNAMBÈ, AMEDEO. On the Interpretation of the Sandage Period-Shift Effect among Globular Cluster RR Lyrae Variables. *Allen V. Sweigart, Albio Renzi, and Amedeo Tornambè*. **312**, 762, 11-C4 (1987)
- On Interacting Helium Star-White Dwarf Pairs as Supernova Precursors. *Icko Iben, Jr., Ken'ichi Nomoto, Amedeo Tornambè, and Alexander V. Tutukov*. **317**, 717, 73-G11 (1987)
- TORRELLES, JOSÉ M. Interaction of the High-Density Gas with the Bipolar Outflow in Cepheus A. *José M. Torrelles, Paul T. P. Ho, Luis F. Rodríguez, Jorge Cantó, and James M. Moran*. **321**, 884, 134-C4 (1987)
- TORRES, ANA V. Ultraviolet Interstellar Extinction toward NGC 6530 and the Intrinsic Energy Distribution of 9 Sagittarii and HD 165052. *Ana V. Torres*. **322**, 949, 150-C7 (1987)
- An Atlas of Optical Spectrophotometry of Wolf-Rayet Carbon and Oxygen Stars. *Ana V. Torres and Philip Massey*. **65**, 459, 35-A2 (1987) (Abstr. in **321**, 1053, 136-A4)
- TOWNSLEY, L. K. Fine-Scale Motion in NGC 6514 and NGC 6523. *C. R. O'Dell, L. K. Townsley, and Hector O. Castañeda*. **317**, 676, 73-D10 (1987)
- TOZZI, G. P. Absolute Oscillator Strengths for 108 Lines of Si I between 163 and 410 Nanometers. *Peter L. Smith, M. C. E. Huber, G. P. Tozzi, H. E. Griesinger, B. L. Cardon, and G. G. Lombardi*. **322**, 573, 144-B12 (1987)
- TREMAINE, SCOTT. Distant Satellites as Probes of Our Galaxy's Mass Distribution. *Blane Little and Scott Tremaine*. **320**, 493, 114-G6 (1987)
- TRESCH-FIENBERG, R. Structure in the Nucleus of NGC 1068 at 10 Microns. *R. Tresch-Fienberg, G. G. Fazio, D. Y. Gezari, W. F. Hoffmann, G. M. Lamb, P. K. Shu, and C. R. McCreight*. **312**, 542, 8-G2 (1987)
- TREVES, A. The Redshift of the BL Lacertae Object PKS 2005-489. *R. Falomo, L. Maraschi, E. G. Tanzi, and A. Treves*. **318**, L39, 92-B1 (1987)
- TREVES, ALDO. A New Soft X-Ray Mode in the AM Herculis Object E2003 + 225. *Julian P. Osborne, Klaus Beuermann, Philip Charles, Laura Maraschi, Koji Mukai, and Aldo Treves*. **315**, L123, 49-E5 (1987)
- TRINCHIERI, G. A Statistical Analysis of the Einstein Normal Galaxy Sample. III. Radio and X-Ray Properties of Elliptical and S0 Galaxies.

- xies. G. Fabbiano, U. Klein, G. Trinchieri, and R. Wielebinski. **312**, 111, 2-C1 (1987)
- X-Ray Observations of Spiral Galaxies. II. Images and Spectral Parameters of 13 Galaxies. G. Fabbiano and G. Trinchieri. **315**, 46, 40-D11 (1987)
- The X-Ray Spectral Properties of the Bulge of M31. G. Fabbiano, G. Trinchieri, and L. S. Van Speybroeck. **316**, 127, 51-D1 (1987)
- TRINCHIERI, GINEVRA. Properties of the X-Ray Emitting Gas in Early-Type Galaxies. Claude R. Canizares, Giuseppina Fabbiano, and Ginevra Trinchieri. **312**, 503, 8-D5 (1987)
- TRIPICCO, MICHAEL J. Lithium in F Stars of Known Age. Ann M. Boesgaard and Michael J. Tripicco. **313**, 389, 19-C8 (1987)
- TRIVEDI, B. M. P. Chemical Condensation in the Outflowing Matter from the Proto-Sun and Its Application to Meteorites. B. M. P. Trivedi. **320**, 430, 112-F11 (1987)
- TRÜMPER, J. Correlation between Spectral State and Quasi-periodic Oscillation Parameters in GX 5-1. M. van der Klis, F. Jansen, J. van Paradijs, W. H. G. Lewin, M. Sztajno, and J. Trümper. **313**, L19, 21-B7 (1987)
- EXOSAT Observations of 4U/MXB 1636 - 53: On the Relation between the Amount of Accreted Fuel and the Strength of an X-Ray Burst. W. H. G. Lewin, W. Penninx, J. van Paradijs, E. Damen, M. Sztajno, J. Trümper, and M. van der Klis. **319**, 893, 104-F9 (1987)
- EXOSAT Observations of 4U 1705 - 44: Type I Bursts and Persistent Emission. A. Langmeier, M. Sztajno, G. Hasinger, J. Trümper, and M. Gottwald. **323**, 288, 156-B13 (1987)
- TRURAN, J. W. Nuclear Chronometers from the *r*-Process and the Age of the Galaxy. John J. Cowan, F.-K. Thielemann, and J. W. Truran. **323**, 543, 160-F1 (1987)
- TRURAN, JAMES W. Chemical Evolution, Stellar Nucleosynthesis, and A Variable Star Formation Rate. Keith A. Olive, Friedrich-Karl Thielemann, and James W. Truran. **313**, 813, 25-F1 (1987)
- The Nature of the Recurrent Novae. Ronald F. Webbink, Mario Livio, James W. Truran, and Marina Orlova. **314**, 653, 36-F9 (1987)
- Spin-up and Mixing in Accreting White Dwarfs. Mario Livio and James W. Truran. **318**, 316, 82-C12 (1987)
- TSAO, C. H. Distributed Retardation of Cosmic Rays. Amri Wandel, David Eichler, John R. Letaw, Rein Silberberg, and C. H. Tsao. **316**, 676, 59-D13 (1987)
- TSUBOI, M. see MAKINO, F., et al.
- TSUJI, TAKASHI. Detection of H¹³CN Maser Emission from the Ground State toward Y Canum Venaticorum. Hideyuki Izumiura, Nobuharu Ukita, Ryohei Kawabe, Norio Kaifu, Takashi Tsuji, Wasaburo Unno, and Kouichi Koyama. **323**, L81, 158-F10 (1987)
- TSURUTA, SACHIKO. Cooling of Neutron Stars: Effects of the Finite Time Scale of Thermal Conduction. Ken'ichi Nomoto and Sachiko Tsuruta. **312**, 711, 10-F4 (1987)
- TUBBS, DAVID L. Neutrino Emission by the Pair, Plasma, and Photo Processes in the Weinberg-Salam Model. Paul J. Schinder, David N. Schramm, Paul J. Wiita, Steven H. Margolis, and David L. Tubbs. **313**, 531, 22-E9 (1987)
- TULLY, R. BRENT. Nearby Groups of Galaxies. II. An All-Sky Survey within 3000 Kilometers per Second. R. Brent Tully. **321**, 280, 125-C7 (1987)
- More About Clustering on a Scale of 0.1 c. R. Brent Tully. **323**, 1, 153-A7 (1987)
- TUOHY, I. R. Discovery of Three New RS Canum Venaticorum-like Counterparts to HEAO 1 X-Ray Sources. D. A. H. Buckley, I. R. Tuohy, R. A. Remillard, H. V. Bradt, and D. A. Schwartz. **315**, 273, 42-G14 (1987)
- Absorption Features from the Accretion Column in E1405 - 451. D. T. Wickramasinghe, I. R. Tuohy, and N. Visvanathan. **318**, 326, 82-D8 (1987)
- TURNER, B. E. A Search for Interstellar Neutral Sodium at 17 Centimeter Wavelength. B. E. Turner. **314**, 363, 32-B6 (1987)
- Detection of Interstellar PN: The First Identified Phosphorus Compound in the Interstellar Medium. B. E. Turner and John Bally. **321**, L75, 129-G11 (1987)
- TURNER, E. L. The Triple Radio Source 0023 + 171: A Candidate for a Dark Gravitational Lens. J. N. Hewitt, E. L. Turner, C. R. Lawrence, D. P. Schneider, J. E. Gunn, C. L. Bennett, B. F. Burke, J. H. Mahoney, G. I. Langston, M. Schmidt, J. B. Oke, and J. G. Hoessel. **321**, 706, 132-C5 (1987)
- TURNER, JEAN L. Recombination Spectroscopy of Star-Formation Regions in the Nucleus of M83. Jean L. Turner, Paul T. P. Ho, and Sara C. Beck. **313**, 644, 23-G2 (1987)
- H₂O Maser Emission from the Nuclei of NGC 253 and M51. Paul T. P. Ho, Robert N. Martin, Christian Henkel, and Jean L. Turner. **320**, 663, 117-A12 (1987)
- Hot Gas in the Nucleus of IC 342: Detection of *J* = 3-2 CO Emission. Paul T. P. Ho, Jean L. Turner, and Robert N. Martin. **322**, L67, 152-B3 (1987)
- TURNER, MICHAEL S. Kinematic Tests of Exotic Flat Cosmological Models. Jane C. Charlton and Michael S. Turner. **313**, 495, 22-C1 (1987)
- The Large-Scale Peculiar Velocity Field in Flat Models of the Universe. Nicola Vittorio and Michael S. Turner. **316**, 475, 57-C1 (1987)
- Double Inflation: A Possible Resolution of the Large-Scale Structure Problem. Michael S. Turner, Jens V. Villumsen, Nicola Vittorio, Joseph Silk, and Roman Juszkiewicz. **323**, 423, 159-C1 (1987)
- TURNESHEK, DAVID A. The Complex Absorption Spectrum of the Broad Absorption Line QSO 1303 + 308. Craig B. Foltz, Ray J. Weymann, Simon L. Morris, and David A. Turneshek. **317**, 450, 68-G10 (1987)
- An Absorption-Line Survey of 32 QSOs at Red Wavelengths: Properties of the Mg II Absorbers. Kenneth M. Lanzetta, David A. Turneshek, and Arthur M. Wolfe. **322**, 739, 148-A2 (1987)
- TUROK, NEIL. Cosmic String Waves. Albert Stebbins, Shoba Veeraraghavan, Robert Brandenberger, Joseph Silk, and Neil Turok. **322**, 1, 138-A7 (1987)
- TUTUKOV, ALEXANDER V. Evolutionary Scenarios for Intermediate-Mass Stars in Close Binaries. Icko Iben, Jr. and Alexander V. Tutukov. **313**, 727, 24-F8 (1987)
- On Interacting Helium Star-White Dwarf Pairs as Supernova Precursors. Icko Iben, Jr., Ken'ichi Nomoto, Amadeo Tornambè, and Alexander V. Tutukov. **317**, 717, 73-G11 (1987)
- TWAROG, BRUCE A. A Reanalysis of Galactic Primary Nucleosynthesis. Bruce A. Twarog and J. Craig Wheeler. **316**, 153, 51-F1 (1987)
- TYLER, G. LEONARD. Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. John D. Anderson, Timothy P. Krisher, Susan E. Borutski, Michael J. Connolly, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen. **323**, L141, 164-E1 (1987)
- TYTLER, DAVID. The Distribution of QSO Absorption System Column Densities: Evidence for a Single Population. David Tytler. **321**, 49, 122-F6 (1987)
- The Redshift Distribution of QSO Lyman-Alpha Absorption Systems. David Tytler. **321**, 69, 122-G12 (1987)
- High-Resolution Spectra of 24 Low-Redshift QSOs: The Properties of Mg II Absorption Systems. David Tytler, A. Boksenberg, Wallace L. W. Sargent, Peter Young, and Daniel Kunth. **64**, 667, 27-B8 (1987) (Abstr. in **318**, 945, 91-C10)
- UKITA, N. High-Resolution Observations of CO from the Bipolar Nebula CRL 2688. R. Kawabe, M. Ishiguro, T. Kasuga, K.-I. Morita, N. Ukita, H. Kobayashi, S. Okumura, E. Fomalont, and N. Kaifu. **314**, 322, 31-F1 (1987)
- Small-Scale Structure and Chemical Differential in the Central Regions of the Sagittarius B2 Molecular Cloud. Paul F. Goldsmith, Ronald L. Snell, T. Hasegawa, and N. Ukita. **314**, 525, 35-C6 (1987)
- Water Maser Emission toward V788 Cygni, A Carbon Star. Y. Nakada, H. Izumiura, T. Onaka, O. Hashimoto, N. Ukita, S. Deguchi, and T. Tanabé. **323**, L77, 158-F6 (1987)
- UKITA, NOBUHARU. Detection of H¹³CN Maser Emission from the Ground State toward Y Canum Venaticorum. Hideyuki Izumiura, Nobuharu Ukita, Ryohei Kawabe, Norio Kaifu, Takashi Tsuji, Wasaburo Unno, and Kouichi Koyama. **323**, L81, 158-F10 (1987)
- ULMER, M. P. Spartan 1 X-Ray Observations of the Perseus Cluster: Comparison of the Iron Abundances and Temperatures in the Inner and Outer Regions of the Cluster. M. P. Ulmer, R. G. Cruddace, E. E. Fenimore, G. G. Fritz, and W. A. Snyder. **319**, 118, 94-C11 (1987)
- ULMSCHNEIDER, P. A Computational Code for Two-dimensional Unsteady Magnetohydrodynamics by the Method of Characteristics. Y. Q. Lou, R. Rosner, and P. Ulmschneider. **315**, 349, 43-F6 (1987)
- ULRICH, M. H. A Detailed Study of the C IV λ 1550 Line Profile and Adjacent Spectral Features in NGC 4151 from 1978 to 1983. J. Clavel, A. Altamero, A. Boksenberg, G. E. Bromage, A. Elvius, D. Pelat, M. V. Penston, G. C. Perola, M. A. J. Snijders, and M. H. Ulrich. **321**, 251, 125-A5 (1987)
- ULVESTAD, JAMES S. A Radiative Bow Shock Wave (?) Driven by Nuclear Ejecta in a Seyfert Galaxy. Andrew S. Wilson and James S. Ulvestad. **319**, 105, 94-B11 (1987)
- UM, I. K. Inversion of the Zodiacal Infrared Brightness Integral. S. S. Hong and I. K. Um. **320**, 928, 120-A5 (1987)
- UMEMURA, MASAYUKI. Formation of Stellar Shells and X-Ray Coronae around Elliptical Galaxies. Masayuki Umemura and Satoru Ikeuchi. **319**, 601, 101-E5 (1987)
- UNDERHILL, A. B. The Problem of V444 Cygni. A. B. Underhill and R. P. Fahey. **313**, 358, 18-G9 (1987)

- UNGERECHTS, H. A Composite CO Survey of the Entire Milky Way. *T. M. Dame, H. Ungerechts, R. S. Cohen, E. J. de Geus, I. A. Grenier, J. May, D. C. Murphy, L.-A. Nymann, and P. Thaddeus*. **322**, 706, 147-D13 (1987)
- A CO Survey of the Dark Nebulae in Perseus, Taurus, and Auriga. *H. Ungerechts and P. Thaddeus*. **63**, 645, 10-D6 (1987) (Abstr. in **313**, 930, 26-G13)
- UNNO, WASABURO. Detection of H^{13}CN Maser Emission from the Ground State toward Y Canum Venaticorum. *Hideyuki Izumiura, Nobuharu Ukita, Ryohei Kawabe, Norio Kaiju, Takashi Tsuji, Wasaburo Unno, and Kouichi Koyama*. **323**, L81, 158-F10 (1987)
- UNWIN, S. C. The Radio Morphology of 3C 120 on Scales from 0.5 Parsecs to 400 Kiloparsecs. *R. C. Walker, J. M. Benson, and S. C. Unwin*. **316**, 546, 58-A5 (1987)
- UOMOTO, A. The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. *R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Leveault*. **317**, 355, 67-F14 (1987)
- URRY, C. M. *see* MAKINO, F., *et al.*
- USOV, V. V. On Two-Stream Instability in Pulsar Magnetospheres. *V. V. Usov*. **320**, 333, 111-F6 (1987)
- VADER, J. PATRICIA. Metal-enhanced Galactic Winds. II. Radiative Cooling and Pressure Effects. *J. Patricia Vader*. **317**, 128, 65-C14 (1987)
- VAIANA, G. S. Variability Analysis in Low Count Rate Sources. *A. Collura, A. Maggio, S. Sciortino, S. Serio, G. S. Vaiana, and R. Rosner*. **315**, 340, 43-E11 (1987)
- Einstein Observatory Survey of X-Ray Emission from Solar-Type Stars: The Late F and G Dwarf Stars. *A. Maggio, S. Sciortino, G. S. Vaiana, P. Majer, J. Bookbinder, L. Golub, F. R. Harnden, Jr., and R. Rosner*. **315**, 687, 48-B8 (1987)
- VALDES, FRANCISCO. The Spatial and Mass Distributions of Molecular Clouds and Spiral Structures. *John Kwan and Francisco Valdes*. **315**, 92, 41-A2 (1987)
- High-Resolution Imaging from Mauna Kea: Globular Clusters in the Coma Cluster Galaxy NGC 4874. *Laird A. Thompson and Francisco Valdes*. **315**, L35, 45-C14 (1987)
- VALLE, K. The Extragalactic Background Light and a Definitive Resolution of Olbers's Paradox. *Paul S. Wesson, K. Valle, and R. Stabell*. **317**, 601, 72-F5 (1987)
- VALLEE, J. P. Sulfur, Carbon, Helium, and Hydrogen 125 α Observations and Physical Analysis of the W48 Neutral Interface. *J. P. Vallee*. **317**, 693, 73-E13 (1987)
- VALVI, F. N. Numerical Implementation of a Perturbation Theory Up to Third Order for Rotating Polytropic Stars: Structure Parameters under Differential Rotation. *V. S. Geroyannis and F. N. Valvi*. **312**, 219, 3-C12 (1987)
- VAN BREUGEL, WIL. Extended Lyman- α Emission in 3C 326.1: A 100 Kiloparsec Cloud of Ionized Gas at a Redshift of 1.82. *Patrick J. McCarthy, Hyron Spinrad, S. Djorgovski, Michael A. Strauss, Wil van Breugel, and James Liebert*. **319**, L39, 107-B2 (1987)
- A Correlation between the Radio and Optical Morphologies of Distant 3CR Radio Galaxies. *Patrick J. McCarthy, Wil van Breugel, Hyron Spinrad, and S. Djorgovski*. **321**, L29, 129-D3 (1987)
- VANDENBERG, DON A. Theoretical Isochrones for Globular Clusters with Predicted Thuan-Gunn Photometry. *R. A. Bell and Don A. Vandenberg*. **63**, 335, 5-D10 (1987) (Abstr. in **312**, 966, 13-E7)
- Theoretical Isochrones for Old, Super-Metal-rich Stars. *Don A. Vandenberg and P. G. Laskarides*. **64**, 103, 18-C9 (1987) (Abstr. in **312**, 965, 13-E6)
- VAN DEN BERGH, SIDNEY. Observations of RR Lyrae Stars in the Halo of M31. *Christopher J. Pritchett and Sidney van den Bergh*. **316**, 517, 57-F2 (1987)
- Observations of Novae in the Virgo Cluster. *Christopher J. Pritchett and Sidney van den Bergh*. **318**, 507, 86-D7 (1987)
- The Supernova Rate in Shapley-Ames Galaxies. *Sidney van den Bergh, Robert D. McClure, and Robert Evans*. **323**, 44, 153-E4 (1987)
- VANDEN BOUT, PAUL. Submillimeter Spectral Line Observations in Very Dense Regions. *Neal J. Evans II, Lee G. Mundy, John H. Davis, and Paul Vanden Bout*. **312**, 344, 4-E13 (1987)
- VAN DER HORN, L. J. Neutrino Flows in Collapsing Stars: A Two-Fluid Model: Erratum. *J. Cooperstein, L. J. van der Horn, and E. A. Baron*. **315**, 729, 48-E10 (1987) (Orig. paper in **309**, 653, 128-D5)
- Neutrino Pair Energy Deposition in Supernovae. *J. Cooperstein, L. J. van der Horn, and E. Baron*. **321**, L129, 137-C7 (1987)
- VAN DER KLIS, M. Correlation between Spectral State and Quasi-periodic Oscillation Parameters in GX 5-1. *M. van der Klis, F. Jansen, J. van Paradijs, W. H. G. Lewin, M. Sztajno, and J. Trümper*. **313**, L19, 21-B7 (1987)
- Intensity and Source State Dependence of the Quasi-periodic Oscillations in Scorpius X-1. *M. van der Klis, L. Stella, N. White, F. Jansen, and A. N. Parmar*. **316**, 411, 54-F3 (1987)
- EXOSAT Observations of 4U/MXB 1636 - 53: On the Relation between the Amount of Accreted Fuel and the Strength of an X-Ray Burst. *W. H. G. Lewin, W. Penninx, J. van Paradijs, E. Damen, M. Sztajno, J. Trümper, and M. van der Klis*. **319**, 893, 104-F9 (1987)
- The Complex Cross-Spectra of Cygnus X-2 and GX 5-1. *M. van der Klis, G. Hasinger, L. Stella, A. Langmeier, J. van Paradijs, and W. H. G. Lewin*. **319**, L13, 100-B2 (1987)
- VAN DER VELDE, J. C. *see* SVOBODA, R. *et al.*
- VAN DISHOECK, EWINE F. Fluorescent Excitation of Interstellar H_2 . *John H. Black and Ewine F. van Dishoeck*. **322**, 412, 142-C11 (1987)
- OH and CH Continuous Opacity in Solar and Stellar Atmospheres. *Robert L. Kurucz, Ewine F. van Dishoeck, and S. P. Tarafdar*. **322**, 992, 150-F13 (1987)
- VAN GORKOM, J. H. The Peculiar Galaxy IC 4553. II. VLA Observations of the Neutral Hydrogen. *Willem A. Baan, J. H. van Gorkom, Joan T. Schmelz, and I. Felix Mirabel*. **313**, 102, 16-B7 (1987)
- The H I Distribution and Kinematics in Four Low-Luminosity Elliptical Galaxies. *George Lake, R. A. Schommer, and J. H. van Gorkom*. **314**, 57, 28-E12 (1987)
- H I Maps of 50 Galaxies with Polar Rings. *J. H. van Gorkom, Paul L. Schechter, and Jerome Kristian*. **314**, 457, 34-E3 (1987)
- Discovery of Low-Redshift, Neutral Hydrogen Absorption in the Radio Spectrum of PKS 2020 - 370. *C. L. Carilli and J. H. van Gorkom*. **319**, 683, 102-D8 (1987)
- VAN HORN, H. M. Magnetic Field Evolution in White Dwarfs. *C. E. Wendell, H. M. Van Horn, and D. Sargent*. **313**, 284, 18-A12 (1987)
- An Independent Method for Determining the Age of the Universe. *D. E. Winget, C. J. Hansen, James Liebert, H. M. Van Horn, G. Fontaine, R. E. Nather, S. O. Kepler, and D. Q. Lamb*. **315**, L77, 49-B1 (1987)
- VAN HOVEN, G. Nonlinear Radiative Condensation in a Sheared Magnetic Field. *G. Van Hoven, L. Sparks, and D. D. Schnack*. **317**, L91, 78-D9 (1987)
- VAN PARADIJS, J. Correlation between Spectral State and Quasi-periodic Oscillation Parameters in GX 5-1. *M. van der Klis, F. Jansen, J. van Paradijs, W. H. G. Lewin, M. Sztajno, and J. Trümper*. **313**, L19, 21-B7 (1987)
- EXOSAT Observations of 4U/MXB 1636 - 53: On the Relation between the Amount of Accreted Fuel and the Strength of an X-Ray Burst. *W. H. G. Lewin, W. Penninx, J. van Paradijs, E. Damen, M. Sztajno, J. Trümper, and M. van der Klis*. **319**, 893, 104-F9 (1987)
- The Complex Cross-Spectra of Cygnus X-2 and GX 5-1. *M. van der Klis, G. Hasinger, L. Stella, A. Langmeier, J. van Paradijs, and W. H. G. Lewin*. **319**, L13, 100-B2 (1987)
- Multipeaked X-Ray Bursts from 4U/MXB 1636 - 53: Evidence against Burst-induced Accretion Disk Coronae. *W. Penninx, J. van Paradijs, and W. H. G. Lewin*. **321**, L67, 129-G4 (1987)
- VAN PARADIJS, JAN. On the Theory of Type I X-Ray Bursts. The Energetics of Bursts and the Nuclear Fuel Reservoir in the Envelope. *Masayuki Y. Fujimoto, Mirek Sztajno, Walter H. G. Lewin, and Jan van Paradijs*. **319**, 902, 104-G5 (1987)
- VAN RIPER, K. A. The Effects of Neutrino Transport on the Collapse of Iron Stellar Cores. *E. S. Myra, S. A. Bludman, Y. Hoffman, I. Lichtenstadt, N. Sack, and K. A. Van Riper*. **318**, 744, 89-B2 (1987)
- VAN SPEYBROECK, L. S. The X-Ray Spectral Properties of the Bulge of M31. *G. Fabbiano, G. Trinchieri, and L. S. Van Speybroeck*. **316**, 127, 51-D1 (1987)
- VARDYA, M. S. Some Comments on Empirical Fits to Stellar Mass Loss Rates. *M. S. Vardya*. **312**, 812, 11-F13 (1987)
- VARNAS, S. R. NGC 5266: An Elliptical Galaxy with a Dust Ring. *S. R. Varnas, F. Bertola, G. Galletta, K. C. Freeman, and D. Carter*. **313**, 69, 15-F12 (1987)
- VASANTHI, M. M. Dynamical Scenarios with Unstable Neutrinos. *T. Padmanabhan and M. M. Vasanthi*. **315**, 411, 45-C1 (1987)
- VEDRENNE, G. Short Solar Events with Evidence of Repetitive Structures. *Upendra D. Desai, Chryssa Koweliotou, C. Barat, K. Hurley, M. Niel, R. Taton, G. Vedrenne, I. V. Estulin, and V. Ch. Dolidze*. **319**, 567, 99-E1 (1987)
- Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. *J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Koweliotou, T. Cline, B. Dennis, U. Desai, and L. Orwig*. **320**, L105, 121-C7 (1987)
- A New Type of Repetitive Behavior in a High-Energy Transient. *J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Koweliotou, T. L. Cline,*

- B. R. Dennis, U. D. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov. **320**, L111, 121-C13 (1987)
- SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806 - 20. C. Kouveliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Neil, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov. **322**, L21, 145-B8 (1987)
- VEERARAGHAVAN, SHOBA. Cosmic String Waves. *Albert Stebbins, Shoba Veeraraghavan, Robert Brandenberger, Joseph Silk, and Neil Turok.* **322**, 1, 138-A7 (1987)
- VEIDT, B. CO Emission from Centaurus A. T. G. Phillips, B. N. Ellison, J. B. Keene, R. B. Leighton, R. J. Howard, C. R. Masson, D. B. Sanders, B. Veidt, and K. Young. **322**, L73, 152-B8 (1987)
- VEILLEUX, SYLVAIN. Spectral Classification of Emission-Line Galaxies. *Sylvain Veilleux and Donald E. Osterbrock.* **63**, 295, 4-G1 (1987) (Abstr. in **312**, 965, 13-E6)
- VELUSAMY, T. Simultaneous VLA Observations of a Flare at 6 and 20 Centimeter Wavelengths. *T. Velusamy, M. R. Kundu, E. J. Schmahl, and M. McCabe.* **319**, 984, 105-F4 (1987)
- Simultaneous 2 and 6 Centimeter Wavelength Observations of a Solar Flare Using the VLA. *M. R. Kundu, T. Velusamy, and S. M. White.* **321**, 593, 128-E9 (1987)
- VERBUNT, FRANK. The Formation of Ultra-Short Period Binaries in Globular Clusters. *Frank Verbunt.* **312**, L23, 7-B9 (1987)
- VERGNE, M. MARCELA. Tidal Stripping and Accretion in Clusters of Galaxies with Smoothly Distributed Missing Mass. *Juan C. Muzzio, Victor H. Dossanuet, and M. Marcela Vergne.* **313**, 112, 16-C4 (1987)
- VERTER, FRANCES. Systematic Properties of CO Emission from Galaxies. I. Luminosity Function. *Frances Verner.* **65**, 555, 37-A1 (1987) (Abstr. in **322**, 1075, 151-G1)
- VESTRAND, W. T. Solar Neutron Emissivity During the Large Flare on 1982 June 3. *E. L. Chupp, H. Debrunner, E. Flückiger, D. J. Forrest, F. Golliez, G. Kanbach, W. T. Vestrand, J. Cooper, and G. Share.* **318**, 913, 91-A1 (1987)
- VESTRAND, W. THOMAS. The Directivity of High-Energy Emission from Solar Flares. II. *Solar Maximum Mission Observations.* *W. Thomas Vestrand, D. J. Forrest, E. L. Chupp, E. Rieger, and G. H. Share.* **322**, 1010, 151-A7 (1987)
- VIDAL-MADIAR, A. IUE Observations of Hydrogen and Deuterium in the Local Interstellar Medium. *J. Murthy, R. C. Henry, H. W. Moos, W. B. Landsman, J. L. Linsky, A. Vidal-Madjar, and C. Gry.* **315**, 675, 48-A10 (1987)
- VIGROUX, L. A Deep Optical Study of the Field of 1E 0630 + 178. *G. F. Bignami, P. A. Caraveo, J. A. Paul, L. Salotti, and L. Vigroux.* **319**, 358, 97-A1 (1987)
- VILHU, O. Spectroscopy of the Rapidly Rotating K Star HD 36705. *O. Vilhu, B. Gustafsson, and B. Edvardsson.* **320**, 850, 119-B5 (1987)
- VILHU, OSMI. Chromospheric-Coronal Activity at Saturated Levels. *Osmi Vilhu and Frederick M. Walter.* **321**, 958, 135-A8 (1987)
- VILLUMSEN, JENS V. Double Inflation: A Possible Resolution of the Large-Scale Structure Problem. *Michael S. Turner, Jens V. Villumsen, Nicola Vittorio, Joseph Silk, and Roman Juszkiewicz.* **323**, 423, 159-C1 (1987)
- VILLUMSEN, JENS VERNER. Cosmological Parameters from the IRAS Galaxy Sample. *Jens Verner Villumsen and Michael A. Strauss.* **322**, 37, 138-D1 (1987)
- VIOTTI, R. First Unambiguous X-Ray Detection of R Aquarii. *R. Viotti, L. Piro, M. Friedjung, and A. Cassatella.* **319**, L7, 100-A10 (1987)
- VISHNIAC, ETHAN T. The Effect of Spherical Voids on the Microwave Background Radiation. *Keith L. Thompson and Ethan T. Vishniac.* **313**, 517, 22-D9 (1987)
- The Growth of Linear Perturbations of Adiabatic Shock Waves. *Dongxu Ryu and Ethan T. Vishniac.* **313**, 820, 25-F8 (1987)
- Were the Lyman- α Clouds Formed from Shocks? *Ethan T. Vishniac and Gary S. Burt.* **319**, 14, 93-B7 (1987)
- Reionization and Small-Scale Fluctuations in the Microwave Background. *Ethan T. Vishniac.* **322**, 597, 146-C13 (1987)
- VISVANATHAN, N. Absorption Features from the Accretion Column in E1405 - 451. *D. T. Wickramasinghe, I. R. Tuohy, and N. Viswanathan.* **318**, 326, 82-D8 (1987)
- VITTORIO, NICOLA. Hot Spots in the Microwave Sky. *Nicola Vittorio and Roman Juszkiewicz.* **314**, L29, 39-A9 (1987)
- The Large-Scale Peculiar Velocity Field in Flat Models of the Universe. *Nicola Vittorio and Michael S. Turner.* **316**, 475, 57-C1 (1987)
- Does Lower α Allow a Resolution of the Large-Scale Structure Problem? *Joseph Silk and Nicola Vittorio.* **317**, 564, 72-C8 (1987)
- Double Inflation: A Possible Resolution of the Large-Scale Structure Problem. *Michael S. Turner, Jens V. Villumsen, Nicola Vittorio, Joseph Silk, and Roman Juszkiewicz.* **323**, 423, 159-C1 (1987)
- VLAHOS, L. Electron Cyclotron Harmonic Wave Acceleration. *H. Kari mabadi, C. R. Menyuk, P. Sprangle, and L. Vlahos.* **316**, 462, 55-B2 (1987)
- VLAHOS, LOUKAS. Evolution of the Axial Electron Cyclotron Maser Instability, with Applications to Solar Microwave Spikes. *Loukas Vlahos and Phillip Sprangle.* **322**, 463, 143-A10 (1987)
- VOGEL, S. N. The Dispersal of Dense Protostellar Material: NH₃ Hot Cores and Outflows in Sagittarius B2. *S. N. Vogel, R. Genzel, and Patrick Palmer.* **316**, 243, 52-F3 (1987)
- Giant Molecular Clouds in M31. *S. N. Vogel, F. Boulanger, and R. Ball.* **321**, L145, 137-D8 (1987)
- VOGES, W. Deterministic Chaos in Accreting Systems: Analysis of the X-Ray Variability of Hercules X-1. *W. Voges, H. Atmanspacher, and H. Scheingraber.* **320**, 794, 118-D10 (1987)
- VOGT, STEVEN S. Doppler Images of Rotating Stars Using Maximum Entropy Image Reconstruction. *Steven S. Vagt, G. Donald Penrod, and Artie P. Hatzes.* **321**, 496, 127-E5 (1987)
- VOIT, G. MARK. Broad, Variable Absorption Lines in the Seyfert Galaxy NGC 3516: Probing the Structure of the Emission-Line Regions. *G. Mark Voit, J. Michael Shull, and Mitchell C. Begelman.* **316**, 573, 58-C5 (1987)
- Rapid Variability of P Cygni Lines in Massive X-Ray Binaries. *Timothy R. Kallman, Richard McCray, and G. Mark Voit.* **317**, 746, 74-B12 (1987)
- VOLK, KEVIN. On the Contribution of Interstellar Extinction to the 10 Micron Dust Feature in OH/IR Stars. *Kevin Volk and Sun Kwok.* **315**, 654, 47-G1 (1987)
- VON BALLMOOS, P. Centaurus A Observation at MeV- Gamma-Ray Energies. *P. von Ballmoos, R. Diehl, and V. Schönfelder.* **312**, 134, 2-D11 (1987)
- Map of the Galactic Center Region in the 1.8 MeV ²⁶Al Gamma-Ray Line. *P. von Ballmoos, R. Diehl, and V. Schönfelder.* **318**, 654, 88-B1 (1987)
- VRBA, F. X-Ray Sources in Regions of Star Formation. II. The Pre-Main-Sequence G Star HDE 283572. *F. M. Walter, A. Brown, J. L. Linsky, A. E. Rydgren, F. Vrba, M. Roth, L. Carrasco, P. F. Chugainov, N. I. Shakouskaya, and C. L. Imhoff.* **314**, 297, 31-D2 (1987)
- VRBA, F. J. Shock-Front Compression of the Magnetic Field in the Canis Major R1 Star Formation Region. *F. J. Vrba, R. Baierlein, and W. Herbst.* **317**, 207, 66-C4 (1987)
- VRBA, FREDERICK. Infrared Photometry and Spectroscopy of Supernova 1986g in NGC 5128-Centaurus A. *Jay A. Frogel, Brooke Gregory, Kimiaki Kawara, Dave Laney, M. M. Phillips, Don Terndrup, Frederick Vrba, and Albert E. Whitford.* **315**, L129, 49-E11 (1987)
- VRBA, FREDERICK J. The Magnetic Evolution of the Taurus Molecular Clouds. I. Large-scale Properties. *Mark H. Heyer, Frederick J. Vrba, Ronald L. Snell, F. P. Schloerb, Stephen E. Strom, Paul F. Goldsmith, and Karen M. Strom.* **321**, 855, 133-G9 (1987)
- VRTILEK, J. M. Laboratory and Astronomical Spectroscopy of C₂H₂, the First Interstellar Organic Ring. *J. M. Vrtilek, C. A. Gottlieb, and P. Thaddeus.* **314**, 716, 37-D8 (1987)
- The Radio Spectrum of Cyclopropene. *J. M. Vrtilek, C. A. Gottlieb, T. J. LePage, and P. Thaddeus.* **316**, 826, 61-B4 (1987)
- WACKER, S. W. Discovery of Optical Circular Polarization in Lambda Andromedae. *J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook.* **317**, L29, 71-C2 (1987)
- WADA, HIROYUKI. The α -Effect Generated by Random Alfvén Waves in a Stratified Atmosphere and Particle Acceleration. *Tomikazu Namikawa, Hiromitsu Hamabata, and Hiroyuki Wada.* **323**, 414, 157-F3 (1987)
- WADA, SETSUOKO. Infrared Spectrum of Quenched Carbonaceous Composite (QCC). II. A New Identification of the 7.7 and 8.6 Micron Unidentified Infrared Emission Bands. *Akira Sakata, Setsuko Wada, Takashi Onaka, and Alan T. Tokunaga.* **320**, L63, 114-E9 (1987)
- WADDELL, P. Detection of the Lensing Galaxy in PG 1115 + 080. *C. A. Christian, D. Crabtree, and P. Waddell.* **312**, 45, 1-D10 (1987)
- WADE, R. The Broad-Line Region at the Center of the Galaxy. *T. R. Geballe, R. Wade, K. Krisciunas, J. Gatley, and M. C. Bird.* **320**, 562, 115-F12 (1987)
- Ionization State in and Reddening to the Center of the Galaxy. *R. Wade, T. R. Geballe, K. Krisciunas, J. Gatley, and M. C. Bird.* **320**, 570, 115-G7 (1987)
- WADE, RICHARD. Near-Infrared Spectra of Seyfert Nuclei. I. The Reddening Problem. *Martin J. Ward, Thomas Geballe, Malcolm Smith, Richard Wade, and Peredur Williams.* **316**, 138, 51-D13 (1987)
- WADEHRA, J. M. The Hydrogen Molecular Ion in an Arbitrary Homogeneous Magnetic Field. *D. R. Brighman and J. M. Wadehra.* **317**, 865, 75-D14 (1987)
- WAGA, IOAV. Inhomogeneous Cosmological Models: New Exact Solu-

- tions with Dust, Isotropic Radiation, and Electromagnetic Field. *Nazira Tomimura and Ioav Waga*. **317**, 52, 64-E2 (1987)
- WAGNER, A. F. Oxygen Chemistry of Shocked Interstellar Clouds. I. Rate Constants for Thermal and Nonthermal Internal Energy Distributions. *A. F. Wagner and M. M. Graff*. **317**, 423, 68-E11 (1987)
- WAGNER, JEREMY. On the Apparent Velocity of Integrated Sunlight. *I. 1983-1985. Drake Deming, Fred Espenak, Donald E. Jennings, James W. Brault, and Jeremy Wagner*. **316**, 771, 60-E4 (1987)
- WAGNER, R. MARK. Ground-based Constraints on the $\text{H}_2\text{O}^+/\text{CO}^+$ Abundance Ratio and Dust Impact Rate in Comet P/Giacobini-Zinner: Comparison with the ICE Spacecraft Results. *R. Mark Wagner, Barry L. Lutz, and S. Wyckoff*. **322**, 544, 143-G9 (1987)
- WAGONER, ROBERT V. Amplification and Polarization of Supernovae by Gravitational Lensing. *P. Schneider and Robert V. Wagoner*. **314**, 154, 29-F2 (1987)
- Spectral Flux from Low-Density Photospheres: Low-Temperature Results. *Stephen Hershkovitz and Robert V. Wagoner*. **322**, 967, 150-D11 (1987)
- WAHLQUIST, H. D. A Search for Sinusoidal Gravitational Radiation in the Period Range 30-2000 Seconds. *J. W. Armstrong, F. B. Estabrook, and H. D. Wahlquist*. **318**, 536, 86-F8 (1987)
- WAKAMATSU, KEN-ICHI. A Seyfert Nucleus of a New Ring Galaxy in Sextans. *Ken-ichi Wakamatsu and Mitsugu T. Nishida*. **315**, L23, 45-B12 (1987)
- WALBORN, NOLAN R. The Composite Image of Sanduleak -69° 202, Candidate Precursor to Supernova 1987A in the Large Magellanic Cloud. *Nolan R. Walborn, Barry M. Lasker, Victoria G. Laidler, and You-Hua Chu*. **321**, L41, 129-E4 (1987)
- Recent Massive Star Formation in 30 Doradus. *Nolan R. Walborn and J. Chris Blades*. **323**, L65, 158-E6 (1987)
- WALDRON, W. L. Velocity Fields in a Low-Latitude Coronal Hole: Results from the Solar Maximum Mission. *D. J. Mullan and W. L. Waldron*. **317**, 487, 69-C5 (1987)
- Magnetohydrodynamic Modeling of Coronal Bright Points. *W. L. Waldron and D. J. Mullan*. **319**, 971, 105-E5 (1987)
- WALKER, A. R. Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. *V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storch-Bergmann, and J. Matthews*. **320**, 589, 116-B3 (1987)
- WALKER, CHRISTOPHER K. Observations of 1.3 Millimeter Emission from the Centers of Galaxies. *Harley A. Thronson, Jr., Christopher K. Walker, Constance E. Walker, and Philip Maloney*. **318**, 645, 88-A4 (1987)
- WALKER, CONSTANCE E. Observations of 1.3 Millimeter Emission from the Centers of Galaxies. *Harley A. Thronson, Jr., Christopher K. Walker, Constance E. Walker, and Philip Maloney*. **318**, 645, 88-A4 (1987)
- WALKER, G. A. H. Three Families of Diffuse Interstellar Bands? *J. Krelowski and G. A. H. Walker*. **312**, 860, 12-C11 (1987)
- Interdependence of the 4430 Å Diffuse Interstellar Band, Polarization, and Ultraviolet Extinction. *J. Krelowski, G. A. H. Walker, G. R. Grieve, and G. M. Hill*. **316**, 449, 55-A3 (1987)
- Discovery of High-Degree Nonradial Oscillations in Rapidly Rotating δ Scuti Stars? *G. A. H. Walker, S. Yang, and G. G. Fahlgren*. **320**, L139, 121-E9 (1987)
- The Primary Orbit and Absorption Lines of HDE 226868 (Cygnus X-1). *Z. Ninkov, G. A. H. Walker, and S. Yang*. **321**, 425, 126-G4 (1987)
- The He II $\lambda 4686$ and H α Emission Lines of Cygnus X-1. *Z. Ninkov, G. A. H. Walker, and S. Yang*. **321**, 438, 127-A3 (1987)
- WALKER, R. C. The Radio Morphology of 3C 120 on Scales from 0.5 Parsecs to 400 Kiloparsecs. *R. C. Walker, J. M. Benson, and S. C. Unwin*. **316**, 546, 58-A5 (1987)
- WALKER, R. N. F. Ariel 6 Measurements of the Fluxes of Ultraheavy Cosmic Rays. *P. H. Fowler, R. N. F. Walker, M. R. W. Mashed, R. T. Moses, A. Worley, and A. M. Gay*. **314**, 739, 37-F7 (1987)
- WALLACE, L. Solar Luminosity Variation. V. The Photospheric Lines 1976-1985. *W. Livingston and L. Wallace*. **314**, 808, 38-D8 (1987)
- WALLACE, RICHARD K. The Core Helium Flash and Surface Abundance Anomalies. *Robert G. Deupree and Richard K. Wallace*. **317**, 724, 74-A4 (1987)
- WALLER, W. H. Where Massive Stars Form: Associated Radio H II Regions and CO Clouds in the Northern Milky Way. *W. H. Waller, D. P. Clemens, D. B. Sanders, and N. Z. Scoville*. **314**, 397, 32-E4 (1987)
- Molecular Clouds and Cloud Cores in the Inner Galaxy. *N. Z. Scoville, Min Su Yun, D. P. Clemens, D. B. Sanders, and W. H. Waller*. **63**, 821, 13-G12 (1987) (Abstr. in **314**, 832, 38-F8)
- WALLERSTEIN, GEORGE. Carbon ($^{12}\text{C}/^{13}\text{C}$) and Oxygen ($^{16}\text{O}/^{17}\text{O}$) Isotopic Ratios in Seven Evolved Stars. *James F. Dominy and George Wallerstein*. **317**, 810, 74-G11 (1987)
- WALSH, J. R. The Planetary Nebula NGC 3918. *R. E. S. Clegg, J. P. Harrington, M. J. Barlow, and J. R. Walsh*. **314**, 551, 35-E7 (1987)
- WALSH, JEREMY R. Nitrogen Abundances in the Amorphous Galaxy NGC 5253. *Jeremy R. Walsh and Jean-René Roy*. **319**, L57, 107-C9 (1987)
- WALTER, F. M. X-Ray Sources in Regions of Star Formation. II. The Pre-Main-Sequence G Star HDE 283572. *F. M. Walter, A. Brown, J. L. Linsky, A. E. Rydgren, F. Vrba, M. Roth, L. Carrasco, P. F. Chugainov, N. I. Shakovskaya, and C. L. Imhoff*. **314**, 297, 31-D2 (1987)
- WALTER, FREDERICK M. Chromospheric-Coronal Activity at Saturated Levels. *Osmi Vilhu and Frederick M. Walter*. **321**, 958, 135-A8 (1987)
- WALTMAN, E. B. Evidence for Refractive Scintillation of Two Extragalactic Sources Seen through the Galactic Disk. *Brian Dennison, R. Fiedler, K. J. Johnston, J. H. Spencer, E. B. Waltman, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. **313**, 141, 16-E5 (1987)
- Daily Observations of Compact Extragalactic Radio Sources at 2695 and 8085 MHz, 1979-1985. *R. L. Fiedler, E. B. Waltman, J. H. Spencer, K. J. Johnston, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. **65**, 319, 33-A5 (1987) (Abstr. in **321**, 1050, 136-A1)
- WALTON, STEPHEN R. Flux Tube Models of Solar Plages. *Stephen R. Walton*. **312**, 909, 12-G7 (1987)
- WAMSTEKER, W. The Fading of the Narrow-Line Region in 3C 390.3. *J. Clavel and W. Wamster*. **320**, L9, 114-A12 (1987)
- WANDEL, AMRI. Distributed Reacceleration of Cosmic Rays. *Amri Wandel, David Eichler, John R. Letaw, Rein Silberberg, and C. H. Tsao*. **316**, 676, 59-D13 (1987)
- The UV Excess of Quasars: Luminosity Dependence. *Amri Wandel*. **316**, L55, 62-B1 (1987)
- WANG, J. C. L. Self-collimated Electromagnetic Jets from Magnetized Accretion Disks. *R. V. E. Lovelace, J. C. L. Wang, and M. E. Sulkkanen*. **315**, 504, 46-C1 (1987)
- WANG, Y.-M. Smearing of a Beaming Pattern by an Isotropic Cloud: An Analysis with Applications to Nonpulsing X-Ray Sources and Cosmic Rays. *Y.-M. Wang and R. Schlickeiser*. **313**, 200, 17-B11 (1987)
- The Origin of Rigidly Rotating Magnetic Field Patterns on the Sun. *N. R. Sheeley, Jr., A. G. Nash, and Y.-M. Wang*. **319**, 481, 98-D5 (1987)
- WANNIER, P. G. Abundances in Red Giant Stars: Carbon and Oxygen Isotopes in Carbon-rich Molecular Envelopes. *P. G. Wannier and R. Sahai*. **319**, 367, 97-B2 (1987)
- WARD, MARTIN. The Continuum of Type 1 Seyfert Galaxies. I. A Single Form Modified by the Effects of Dust. *Martin Ward, Martin Elvis, G. Fabbiano, N. P. Carleton, S. P. Willner, and A. Lawrence*. **315**, 74, 40-F12 (1987)
- The Continuum of Type 1 Seyfert Galaxies. II. Separating Thermal and Nonthermal Components. *N. P. Carleton, Martin Elvis, G. Fabbiano, S. P. Willner, A. Lawrence, and Martin Ward*. **318**, 595, 87-D6 (1987)
- WARD, MARTIN J. Near-Infrared Spectra of Seyfert Nuclei. I. The Reddening Problem. *Martin J. Ward, Thomas Geballe, Malcolm Smith, Richard Wade, and Peredur Williams*. **316**, 138, 51-D13 (1987)
- WARDLE, J. F. C. Linear Polarization Structure of the BL Lacertae Object OJ 287 at Milliarcsecond Resolution. *D. H. Roberts, D. C. Gabuzda, and J. F. C. Wardle*. **323**, 536, 160-E5 (1987)
- WARDLE, MARK. Oblique Magnetohydrodynamic Shock Waves in Molecular Clouds. *Mark Wardle and B. T. Draine*. **321**, 321, 125-F8 (1987)
- WARNER, BRIAN. The Period Distribution and Evolution of Short-Period Cataclysmic Variables. *Brian Warner and Mario Livio*. **322**, L95, 152-C14 (1987)
- WARREN-SMITH, R. F. Polarimetry of the NGC 2261/R Monocerotis System and the Faint Jetlike Feature to its Southwest. *R. F. Warren-Smith, P. W. Draper, and S. M. Scarrott*. **315**, 500, 46-B11 (1987)
- WASSERMAN, I. Deceleration of Infalling Plasma in the Atmospheres of Accreting Neutron Stars. I. Isothermal Atmospheres. *G. S. Miller, E. E. Salpeter, and I. Wasserman*. **314**, 215, 30-D13 (1987)
- WASSERMAN, IRA. The Dynamical Fate of Wide Binaries in the Solar Neighborhood. *Martin D. Weinberg, Stuart L. Shapiro, and Ira Wasserman*. **312**, 367, 4-G9 (1987)
- Theoretical Implications of Wide Binary Observations. *Ira Wasserman and Martin D. Weinberg*. **312**, 390, 5-B4 (1987)
- WATANABE, MASAOKI. NGC 3928: A Highly Bulge-dominated Compact Spiral Galaxy. *Yoshiaki Taniguchi and Masaaki Watanabe*. **313**, 89, 16-A5 (1987)
- WATSON, D. M. Far-Infrared Measurements of N/O in H II Regions: Evidence for Enhanced CN Process Nucleosynthesis in the Inner Galaxy. *D. F. Lester, H. L. Dinerstein, M. W. Werner, D. M. Watson, R. Genzel, and J. W. V. Storey*. **320**, 573, 116-A1 (1987)
- WATSON, WILLIAM D. Electron Scintillation in Gravitationally Lensed

- Images of Astrophysical Radio Sources. *Shuji Deguchi and William D. Watson*. **315**, 440, 45-E4 (1987)
- WEAST, G. J. X-Ray and Ultraviolet Radiation from Accreting White Dwarfs. IV. Two-Temperature Treatment with Electron Thermal Conduction. *J. N. Imamura, R. H. Durisen, D. Q. Lamb, and G. J. Weast*. **313**, 298, 18-B14 (1987)
- WEAVER, THOMAS A. Supernova 1987A in the Large Magellanic Cloud: The Explosion of a $\sim 20 M_{\odot}$ Star Which Has Experienced Mass Loss? *S. E. Woosley, P. A. Pinto, P. G. Martin, and Thomas A. Weaver*. **318**, 664, 88-B11 (1987)
- WEAVER, WM. BRUCE. Anomalous Distribution of Axial Inclinations of T Tauri Stars. *Wm. Bruce Weaver*. **319**, L89, 107-E3 (1987)
- WEBB, D. F. The Plasma and Magnetic Field Properties of Coronal Loops Observed at High Spatial Resolution. *D. F. Webb, G. D. Holman, J. M. Davis, M. R. Kundu, and R. K. Shevgaonkar*. **315**, 716, 48-D11 (1987)
- WEBB, G. M. Hydrodynamical Constraints on Cosmic-Ray Acceleration in Relativistic Shocks. *G. M. Webb*. **319**, 215, 95-C12 (1987)
- Energetic Particle Acceleration in Spherically Symmetric Accretion Flows and Shocks. *G. M. Webb and T. J. Bogdan*. **320**, 683, 117-C4 (1987)
- Relativistic Transport Theory for Cosmic Rays: Erratum. *G. M. Webb*. **321**, 606, 128-G2 (1987) (Orig. paper in **296**, 319, 93-D7)
- Cosmic-Ray-modified Stellar Winds. I. Solution Topologies and Singularities. *C. M. Ko and G. M. Webb*. **323**, 657, 162-A1 (1987)
- WEBB, J. K. High-Redshift QSO Absorbing Clouds and the Background Ionizing Source. *R. F. Carswell, J. K. Webb, J. A. Baldwin, and B. Atwood*. **319**, 709, 102-F13 (1987)
- WEBB, JOHN K. The Remarkable Broad Absorption Line QSO 0059 - 2735 with Extensive Fe II Absorption. *C. Hazard, Richard G. McMahon, John K. Webb, and Donald C. Morton*. **323**, 263, 156-A1 (1987)
- WEBBER, W. R. A Reexamination of the Cosmic-Ray Helium Spectrum and the $^3\text{He}/^4\text{He}$ Ratio at High Energies. *W. R. Webber, R. L. Golden, and R. A. Mewaldt*. **312**, 178, 2-G13 (1987)
- Interplanetary Radial Cosmic-Ray Gradients and Their Implication for a Possible Large Modulation Effect at the Heliospheric Boundary. *W. R. Webber and J. A. Lockwood*. **317**, 534, 69-F11 (1987)
- WEBBINK, RONALD F. The Nature of the Recurrent Novae. *Ronald F. Webbink, Mario Livio, James W. Truran, and Marina Orio*. **314**, 653, 36-F9 (1987)
- Thresholds for Rapid Mass Transfer in Binary System. I. Polytropic Models. *Michael S. Hjellming and Ronald F. Webbink*. **318**, 794, 89-E10 (1987)
- WEBSTER, B. LOUISE. New Evolutionary Relationships for Magellanic Cloud Planetary Nebulae. *Michael A. Dopita, Stephen J. Meatheringham, Peter R. Wood, B. Louise Webster, David H. Morgan, and Holland C. Ford*. **315**, L107, 49-D2 (1987)
- WEBSTER, RACHEL. Substructure in the Coma Cluster. *Michael Fitchett and Rachel Webster*. **317**, 653, 73-C1 (1987)
- WEEDMAN, DANIEL W. Isophotal Diameters of Galaxies at High Redshifts. *Daniel W. Weedman and Karen L. Williams*. **318**, 585, 87-C10 (1987)
- Evidence of an Infrared Luminosity Indicator for Galaxies. *Eric D. Feigelson, Takashi Ito, and Daniel W. Weedman*. **319**, L51, 107-C4 (1987)
- WEFEL, J. P. Cosmic Ray Propagation in the Galaxy and in the Heliosphere: The Path-Length Distribution at Low Energy. *M. Garcia-Munoz, J. A. Simpson, T. G. Guzik, J. P. Wefel, and S. H. Margolis*. **314**, 269, 19-F6 (1987) (Abstr. in **315**, 733, 48-E14)
- WEGNER, G. The Exotic Helium Variable PG 1346 + 082. *M. A. Wood, D. E. Winget, R. E. Nather, Frederic V. Hessman, James Liebert, Donald W. Kurtz, F. Wesemael, and G. Wegner*. **313**, 757, 25-B1 (1987)
- Ultraviolet and Visual Spectroscopy of DB White Dwarfs. *G. Wegner and E. P. Nelan*. **319**, 916, 105-A5 (1987)
- WEGNER, GARY. Spectroscopy and Photometry of Elliptical Galaxies. I. New Distance Estimator. *Alan Dressler, Donald Lynden-Bell, David Burstein, Roger L. Davies, S. M. Faber, Roberto Terlevich, and Gary Wegner*. **313**, 42, 15-D7 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies: A Large-Scale Streaming Motion in the Local Universe. *Alan Dressler, S. M. Faber, David Burstein, Roger L. Davies, Donald Lynden-Bell, R. J. Terlevich, and Gary Wegner*. **313**, L37, 27-A9 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies. II. The Spectroscopic Parameters. *Roger L. Davies, David Burstein, Alan Dressler, S. M. Faber, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner*. **64**, 581, 26-B1 (1987) (Abstr. in **318**, 944, 91-C9)
- Spectroscopy and Photometry of Elliptical Galaxies. III. *UVB* Aperture Photometry, CCD Photometry, and Magnitude-related Parameters. *David Burstein, Roger L. Davies, Alan Dressler, S. M. Faber, Remington P. S. Stone, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner*. **64**, 601, 26-C7 (1987) (Abstr. in **318**, 944, 91-C9)
- WEHLAU, WILLIAM H. The Rich *p*-Mode Spectrum of the Rapidly Oscillating Peculiar A Star HD 60435. *Jaymie M. Matthews, Donald W. Kurtz, and William H. Wehlau*. **313**, 782, 25-C12 (1987)
- WEHRLE, ANN E. An Unusual Radio Loop in the Edge-on Seyfert Galaxy NGC 5506. *Ann E. Wehrle and Mark Morris*. **313**, L43, 27-B1 (1987)
- WEILER, THOMAS J. The Initial Neutrino Events from Supernovae as Evidence for Matter versus Antimatter. *Alan V. Barnes, Thomas J. Weiler, and Sandip Pakvasa*. **323**, L31, 158-C4 (1987)
- WEINBERG, D. The Evolution of Red Clump Stars: Theoretical Sequences. *E. Seidel, P. Demarque, and D. Weinberg*. **63**, 917, 15-B13 (1987) (Abstr. in **314**, 832, 38-F8)
- WEINBERG, DAVID H. A Quantitative Approach to the Topology of Large-Scale Structure. *J. Richard Gott III, David H. Weinberg, and Adrian L. Melott*. **319**, 1, 93-A7 (1987)
- The Topology of Large-Scale Structure. Topology and the Random Phase Hypothesis. *David H. Weinberg, J. Richard Gott III, and Adrian L. Melott*. **321**, 2, 122-A8 (1987)
- WEINBERG, MARTIN D. The Dynamical Fate of Wide Binaries in the Solar Neighborhood. *Martin D. Weinberg, Stuart L. Shapiro, and Ira Wasserman*. **312**, 367, 4-G9 (1987)
- Theoretical Implications of Wide Binary Observations. *Ira Wasserman and Martin D. Weinberg*. **312**, 390, 5-B4 (1987)
- WEINTRAUB, D. A. Structure of a Possible Circumbinary Disk around T Tauri. *D. A. Weintraub, C. R. Masson, and B. Zuckerman*. **320**, 336, 111-F9 (1987)
- WEISSKOPF, M. C. Coherence Effects on Quasi-periodic Oscillations from Galactic X-Ray Sources. *R. F. Elsner, N. Shibasaki, and M. C. Weisskopf*. **320**, 527, 115-C8 (1987)
- The Effect of Decay of the Amplitude of Oscillation on Random Process Models for QPO X-Ray Stars. *N. Shibasaki, R. F. Elsner, and M. C. Weisskopf*. **322**, 831, 149-A1 (1987)
- WELCH, DOUGLAS L. Spectroscopy and JHK Photometry of Type II Cepheids in the Magellanic Clouds. *Douglas L. Welch*. **317**, 672, 73-D6 (1987)
- Near-Infrared Observations of Cepheids: The Distance to NGC 300. *Barry F. Madore, Douglas L. Welch, C. W. McAlary, and R. A. McLaren*. **320**, 26, 108-C4 (1987)
- Distance Moduli and Structure of the Magellanic Clouds from Near-Infrared Photometry of Classical Cepheids. *Douglas L. Welch, Robert A. McLaren, Barry F. Madore, and Christopher W. McAlary*. **321**, 162, 124-A7 (1987)
- WELCH, WM. J. Study of the H42 α (86 GHz) Recombination Line in W3(OH). *Wm. J. Welch and J. Marr*. **317**, L21, 71-B10 (1987)
- WELLINGTON, K. J. Widespread Strong Methanol Masers near H II Regions. *R. P. Norris, J. L. Caswell, F. F. Gardnes, and K. J. Wellington*. **321**, L159, 137-E8 (1987)
- WELTY, ALAN D. The Distribution of Maser Emission in OH/IR Stars. *Alan D. Welty, John D. Fix, and Robert L. Mutel*. **318**, 852, 90-C10 (1987)
- WENDELL, C. E. Magnetic Field Evolution in White Dwarfs. *C. E. Wendell, H. M. Van Horn, and D. Sargent*. **313**, 284, 18-A12 (1987)
- WENTZEL, DONAT G. Solar Oscillations: A Method for Deriving Nonlinear Effects. *Donat G. Wentzel*. **317**, 477, 69-B10 (1987)
- Solar Oscillations: Generation of a *g*-Mode by Two *p*-Modes. *Donat G. Wentzel*. **319**, 966, 105-D14 (1987)
- WERNER, M. W. IRAS Surface Brightness Maps of Reflection Nebulae in the Pleiades. *Michael W. Castellet, K. Sellgren, and M. W. Werner*. **313**, 853, 26-B1 (1987)
- Far-Infrared Measurements of N/O in H II Regions: Evidence for Enhanced CN Process Nucleosynthesis in the Inner Galaxy. *D. F. Lester, H. L. Dinerstein, M. W. Werner, D. M. Watson, R. Genzel, and J. W. V. Storey*. **320**, 573, 116-A1 (1987)
- WERNER, MICHAEL W. Observations of Infrared Emission from a Fast-moving Knot in Cassiopeia A. *Harriet L. Dinerstein, Daniel F. Lester, David M. Rank, Michael W. Werner, and Diane H. Wooden*. **312**, 314, 4-C11 (1987)
- WESEMAEL, F. The Exotic Helium Variable PG 1346 + 082. *M. A. Wood, D. E. Winget, R. E. Nather, Frederic V. Hessman, James Liebert, Donald W. Kurtz, F. Wesemael, and G. Wegner*. **313**, 757, 25-B1 (1987)
- Studies of Hot B Subdwarfs. V. Continuing Investigation of the C, N, and Si Abundance Patterns in the Atmospheres of sdB Stars. *R. Lamontagne, F. Wesemael, and G. Fontaine*. **318**, 844, 90-C1 (1987)
- WESSON, PAUL S. The Extragalactic Background Light and a Definitive Resolution of Olbers's Paradox. *Paul S. Wesson, K. Valle, and R. Stabell*. **317**, 601, 72-F5 (1987)
- WEST, MICHAEL J. Profiles of Clusters of Galaxies: Cosmological Scenarios versus Observations. *Michael J. West, Avishai Dekel, and Augustus Oemler, Jr.*. **316**, 1, 50-A8 (1987)

- WEST, STEVEN C. The Hiss of BL Lacertae. *Richard L. Moore, Gary D. Schmidt, and Steven C. West*. **314**, 176, 29-G10 (1987)
- The Discovery of Near-Infrared Polarized Cyclotron Emission in the Intermediate Polar BG Canis Minoris. *Steven C. West, Graham Beuiman, and Gary D. Schmidt*. **322**, L35, 145-C7 (1987)
- WESTERGAARD, N. J. X-Ray Observations of the Supernova Remnant N103B in the Large Magellanic Cloud. *K. P. Singh, N. J. Westergaard, H. W. Schnopper, and D. J. Helfand*. **322**, 80, 138-G3 (1987)
- WESTERN, L. R. Cylindrical Astrophysical Maser Models: Polarization Due to Magnetic Fields. *L. R. Western*. **317**, 858, 75-D7 (1987)
- WEYMANN, RAY J. The Integrated Ultraviolet Radiation Field from QSOs. *Jill Bechtold, Ray J. Weymann, Zuo Lin, and Matthew A. Malkan*. **315**, 180, 42-A4 (1987)
- The Complex Absorption Spectrum of the Broad Absorption Line QSO 1303 + 308. *Craig B. Foltz, Ray J. Weymann, Simon L. Morris, and David A. Turnshek*. **317**, 450, 68-G10 (1987)
- WHEATON, WM. A. Long-Term Gamma-Ray Spectral Variability of Cygnus X-1. *J. C. Ling, W. A. Mahoney, Wm. A. Wheaton, and A. S. Jacobson*. **321**, L117, 137-B8 (1987)
- WHEELER, J. C. Supernovae 1983i and 1983v: Evidence for Abundance Variations in Type Ib Supernovae. *J. C. Wheeler, R. P. Harkness, E. S. Barker, A. L. Cochran, and D. Wills*. **313**, L69, 27-C11 (1987)
- The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. *R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Leveault*. **317**, 355, 67-F14 (1987)
- WHEELER, J. CRAIG. A Reanalysis of Galactic Primary Nucleosynthesis. *Bruce A. Twarog and J. Craig Wheeler*. **316**, 153, 51-F1 (1987)
- A Linear Thermal Stability Analysis for the Vertical Structure of Alpha Model Accretion Disks. *Hideyuki Saio, John K. Cannizzo, and J. Craig Wheeler*. **316**, 716, 60-A1 (1987)
- Models for Type Ia Supernovae with Composition Inversions. *J. Craig Wheeler, Douglas Swartz, Zong-wei Li, and Peter G. Sutherland*. **316**, 733, 60-B5 (1987)
- WHITE, GLENN J. Observations of Globules and Dark Clouds in the CO $J = 3-2$ and $J = 2-1$ Lines. *L. W. Avery, Glenn J. White, I. P. Williams, and N. Cronin*. **312**, 848, 12-B13 (1987)
- WHITE, N. Intensity and Source State Dependence of the Quasi-periodic Oscillations in Scorpius X-1. *M. van der Klis, L. Stella, N. White, F. Jansen, and A. N. Parmar*. **316**, 411, 54-F3 (1987)
- WHITE, N. E. The Discovery of a Second Orbital Period from the X-Ray Source 4U 1820 - 30 in the Globular Cluster NGC 6624. *L. Stella, W. Priedhorsky, and N. E. White*. **312**, L17, 7-B4 (1987)
- EXOSAT Observations of Double-peaked Bursts with Radius Expansion from 4U/MXB 1820 - 30. *F. Haberl, L. Stella, N. E. White, W. C. Priedhorsky, and M. Gottwald*. **314**, 266, 31-A9 (1987)
- The Discovery of 15-30 Hertz Quasi-periodic Oscillations in the X-Ray flux of 4U 1820 - 30. *L. Stella, N. E. White, and W. Priedhorsky*. **315**, L49, 45-E3 (1987)
- The Discovery of 7 and 24-28 Hertz Quasi-periodic Oscillations in the X-Ray Flux of GX 17 + 2 (4U 1812 - 14). *L. Stella, A. N. Parmar, and N. E. White*. **321**, 418, 126-F11 (1987)
- The Properties of Bursts with Short Recurrence Times from the Transient X-Ray Source EXO 0748 - 676. *M. Gottwald, F. Haberl, A. N. Parmar, and N. E. White*. **323**, 575, 161-A11 (1987)
- WHITE, RAYMOND E. Axial Ratios and Orientations for 100 Galactic Globular Star Clusters. *Raymond E. White and Stephen J. Shawl*. **317**, 246, 66-E13 (1987)
- WHITE, RAYMOND E., III. Star Formation in X-Ray Cluster Cooling Flows. *Raymond E. White III and Craig L. Sarazin*. **318**, 612, 87-E9 (1987)
- Determining Star Formation Rates in X-Ray Cluster Cooling Flows. *Raymond E. White III and Craig L. Sarazin*. **318**, 621, 87-F5 (1987)
- Numerical Models of Star Formation in X-Ray Cluster Cooling Flows. *Raymond E. White III and Craig L. Sarazin*. **318**, 629, 87-F14 (1987)
- Steady State Cooling Flow Models for Normal Elliptical Galaxies. *Craig L. Sarazin and Raymond E. White III*. **320**, 32, 108-C11 (1987)
- WHITE, S. M. Microwave Observations of Flare Stars UV Ceti, AT Microscopii, and AU Microscopii. *M. R. Kundu, P. D. Jackson, S. M. White, and M. Melozzi*. **312**, 822, 12-A1 (1987)
- Simultaneous 2 and 6 Centimeter Wavelength Observations of a Solar Flare Using the VLA. *M. R. Kundu, T. Velusamy, and S. M. White*. **321**, 593, 128-E9 (1987)
- WHITE, SIMON D. M. Clusters, Filaments, and Voids in a Universe Dominated by Cold Dark Matter. *Simon D. M. White, Carlos S. Frenk, Marc Davis, and George Efstathiou*. **313**, 505, 22-C11 (1987)
- The Appearance of Primeval Galaxies. *E. Baron and Simon D. M. White*. **322**, 585, 146-C1 (1987)
- WHITE, STEPHEN M. Dynamic Spectrum of a Radio Flare on UV Ceti. *Peter D. Jackson, Mukul R. Kundu, and Stephen M. White*. **316**, L85, 62-C14 (1987)
- WHITFORD, A. E. M. Giants in Baade's Window: Infrared Colors, Luminosities, and Implications for the Stellar Content of E and S0 Galaxies. *Jay A. Frogel and A. E. Whitford*. **320**, 199, 110-C10 (1987)
- WHITFORD, ALBERT E. Infrared Photometry and Spectroscopy of Supernova 1986g in NGC 5128-Centaurus A. *Jay A. Frogel, Brooke Gregory, Kimiaki Kawara, Dave Laney, M. M. Phillips, Don Terndrup, Frederick Vrba, and Albert E. Whitford*. **315**, L129, 49-E11 (1987)
- WHITMORE, BRADLEY C. The Shape of the Dark Halo in Polar-Ring Galaxies. *Bradley C. Whitmore, Douglas B. McElroy, and François Schweizer*. **314**, 439, 34-C9 (1987)
- WHITNEY, SCOTT. The Perseus Flasher and Satellite Glints. *Bradley E. Schaefer, Michael Barber, John J. Brooks, Allen DeForrest, Paul D. Maley, Norman W. McLeod III, Russ McNiel, Andrew J. Noymer, A. K. Presnell, Richard Schwartz, and Scott Whitney*. **320**, 398, 112-D2 (1987)
- WHITTLE, MARK. Kinematics and Ionization of Extended Gas in Active Galaxies. III. The Extranuclear Properties of NGC 1068. *J. A. Baldwin, A. S. Wilson, and Mark Whittle*. **319**, 84, 94-A3 (1987)
- WIBBERENZ, G. A Multispacecraft Study of the Injection and Transport of Solar Energetic Particles. *J. Beeck, G. M. Mason, D. C. Hamilton, G. Wibberenz, H. Kunow, D. Hoestadt, and B. Klecker*. **322**, 1052, 151-D14 (1987)
- WICHOSKI, U. F. A Search for QSOs to Fit a Cosmological Model with Flat, Closed Spatial Sections. *H. V. Fagundes and U. F. Wichoski*. **322**, L5, 145-A8 (1987)
- WICKRAMASINGHE, D. T. Absorption Features from the Accretion Column in E1405 - 451. *D. T. Wickramasinghe, I. R. Tuohy, and N. Visvanathan*. **318**, 326, 82-D8 (1987)
- WIDING, KENNETH G. SKYLAB XUV Observations of Densities, Thermal Structure, and Mass Motions in a Compact Flare. *Kenneth G. Widing and J. W. Cook*. **320**, 913, 119-F14 (1987)
- WIELEBINSKI, R. A Statistical Analysis of the Einstein Normal Galaxy Sample. III. Radio and X-Ray Properties of Elliptical and S0 Galaxies. *G. Fabbiano, U. Klein, G. Trinchieri, and R. Wielebinski*. **312**, 111, 2-C1 (1987)
- WIESCHER, MICHAEL. Alpha-Burning of ^{14}O . *Michael Wiescher, Volker Harms, Joachim Göres, Friedrich-Karl Thieleman, and Lawrence J. Rybicki*. **316**, 162, 51-F10 (1987)
- WIITA, PAUL J. Neutrino Emission by the Pair, Plasma, and Photo Processes in the Weinberg-Salam Model. *Paul J. Schinder, David N. Schramm, Paul J. Wiita, Steven H. Margolis, and David L. Tubbs*. **313**, 531, 22-E9 (1987)
- Beam Models for Radio Sources. VI. Evolution of Magnetized Jets in Power-Law Potentials. *M. Javad Siah and Paul J. Wiita*. **313**, 623, 23-E8 (1987)
- WILKES, BELINDA J. Is Optical Fe II Emission Related to the Soft X-Ray Properties of Quasars? *Belinda J. Wilkes, Martin Elvis, and Ian McHardy*. **321**, L23, 129-C12 (1987)
- Quasar Energy Distributions. I. Soft X-Ray Spectra of Quasars. *Belinda J. Wilkes and Martin Elvis*. **323**, 243, 155-F5 (1987)
- WILKING, B. A. Milliarcsecond Resolution Infrared Observations of Young Stars in Taurus and Ophiuchus. *M. Simon, R. R. Howell, A. J. Longmore, B. A. Wilking, D. M. Peterson, and W.-P. Chen*. **320**, 344, 111-G3 (1987)
- Water Masers Associated with Low-Mass Stars: A Survey of the Rho Ophiuchi Infrared Cluster. *B. A. Wilking and M. J. Claussen*. **320**, L133, 121-E4 (1987)
- WILKING, BRUCE A. Molecular Clouds in the Outer Galaxy. I. Far-Infrared Observations. *Kathryn N. Mead, Marc L. Kutner, Neal J. Evans II, Paul M. Harvey, and Bruce A. Wilking*. **312**, 321, 4-D4 (1987)
- An Active Star Formation Site in RCW 108. *Steven Straw, A. R. Hyland, Terry J. Jones, Paul M. Harvey, Bruce A. Wilking, and Marshall Joy*. **314**, 283, 31-B12 (1987)
- WILKINSON, DAVID T. A 1% Measurement of the Temperature of the Cosmic Microwave Radiation at $\lambda = 1.2$ Centimeters. *David G. Johnson and David T. Wilkinson*. **313**, L1, 21-A4 (1987)
- WILLIAMS, B. A. Neutral Hydrogen in Compact Groups of Galaxies. *B. A. Williams and Herbert J. Rood*. **63**, 265, 4-C8 (1987) (Abstr. in **312**, 964, 13-E5)
- WILLIAMS, HAROLD A. Linear and Nonlinear Dynamic Instability of Rotating Polytropes. *Harold A. Williams and Joel E. Tohline*. **315**, 594, 47-B10 (1987)
- WILLIAMS, I. P. Observations of Globules and Dark Clouds in the CO $J = 3-2$ and $J = 2-1$ Lines. *L. W. Avery, Glenn J. White, I. P. Williams, and N. Cronin*. **312**, 848, 12-B13 (1987)
- WILLIAMS, KAREN L. Isophotal Diameters of Galaxies at High Redshifts. *Daniel W. Weedman and Karen L. Williams*. **318**, 585, 87-C10 (1987)
- WILLIAMS, P. M. see MAKINO, F., et al.
- WILLIAMS, PEREDUR. Near-Infrared Spectra of Seyfert Nuclei. I. The Reddening Problem. *Martin J. Ward, Thomas Geballe, Malcolm*

- Smith, Richard Wade, and Peredur Williams. **316**, 138, 51-D13 (1987)
- WILLIAMS, PEREDUR M. An Eight-Year Spectroscopic Orbit for the WC7 + O4 Wolf-Rayet Binary HD 193793: Toward Solving the Mystery of the Infrared Outbursts. Anthony F. Moffat, Robert Lamontagne, Peredur M. Williams, Jiri Horn, and Wilhelm Seggewiss. **312**, 807, 11-F8 (1987)
- Near-Infrared H₂ Emission from Herbig-Haro Objects. I. A Survey of Low-Excitation Objects. Richard D. Schwartz, Martin Cohen, and Peredur M. Williams. **322**, 403, 142-C2 (1987)
- WILLIAMS, R. E. Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storch-Bergmann, and J. Matthews. **320**, 589, 116-B3 (1987)
- Supernova 1987A in the Large Magellanic Cloud: Possible s-Process Enhancements in the Progenitor. R. E. Williams. **320**, L117, 121-D4 (1987)
- WILLIAMS, T. B. Forbidden [O II] and [O III] Emission 29'' from a QSO Absorption-Line Region. Brian Yanny, Don Hamilton, R. A. Schommer, T. B. Williams, and D. G. York. **323**, L19, 158-B7 (1987)
- WILLMARTH, DARYL W. The Binary Frequency of High-Velocity Field Dwarfs as Obtained with CCD Measures. Helmut A. Abt and Daryl W. Willmarth. **318**, 786, 89-E1 (1987)
- WILLNER, S. P. The Continuum of Type 1 Seyfert Galaxies. I. A Single Form Modified by the Effects of Dust. Martin Ward, Martin Elvis, G. Fabbiano, N. P. Carleton, S. P. Willner, and A. Lawrence. **315**, 74, 40-F12 (1987)
- BE Ursae Majoris: A Detached Binary with a Unique Reprocessing Spectrum. Donald H. Ferguson, James Liebert, Roc Cutri, Richard F. Green, S. P. Willner, João E. Steiner, and Susan Tokarz. **316**, 399, 54-D4 (1987)
- The Continuum of Type 1 Seyfert Galaxies. II. Separating Thermal and Nonthermal Components. N. P. Carleton, Martin Elvis, G. Fabbiano, S. P. Willner, A. Lawrence, and Martin Ward. **318**, 595, 87-D6 (1987)
- Far-Infrared Luminosities of Markarian Starburst Galaxies. II. Individual Galaxies. L. K. Deutsch and S. P. Willner. **63**, 803, 13-E14 (1987) (Abstr. in **314**, 831, 38-F7)
- WILLS, D. Supernovae 1983i and 1983v: Evidence for Abundance Variations in Type Ib Supernovae. J. C. Wheeler, R. P. Harkness, E. S. Barker, A. L. Cochran, and D. Wills. **313**, L69, 27-C11 (1987)
- WILLSON, L. A. A Comparison between Mass-Losing and Standard Solar Models. Joyce A. Guzik, L. A. Willson, and Wendee M. Brunish. **319**, 957, 105-D5 (1987)
- WILLSON, R. F. The Interstellar Clouds toward 3C 154 and 3C 353. S. R. Federman, Neal J. Evans II, R. F. Willson, E. Falgarone, F. Combes, and B. M. Scheufele. **322**, 960, 150-D4 (1987)
- WILLSON, ROBERT F. Multiple Wavelength Microwave Observations of the RS Canum Venaticorum Stars UX Arietis, HR 1099, HR 5110, and II Pegasi. Robert F. Willson and Kenneth R. Lang. **312**, 278, 4-A2 (1987)
- VLA Observations of a Solar Noise Storm. Kenneth R. Lang and Robert F. Willson. **319**, 514, 98-G8 (1987)
- Simultaneous SMM Flat Crystal Spectrometer and Very Large Array Observations of Solar Active Regions. Kenneth R. Lang, Robert F. Willson, Kermit L. Smith, and Keith T. Strong. **322**, 1035, 151-C4 (1987)
- Solar Active Region Physical Parameters Inferred from a Thermal Cyclotron Line and Soft X-Ray Spectral Lines. Kenneth R. Lang, Robert F. Willson, Kermit L. Smith, and Keith T. Strong. **322**, 1044, 151-D3 (1987)
- WILSON, A. S. Kinematics and Ionization of Extended Gas in Active Galaxies. III. The Extranuclear Properties of NGC 1068. J. A. Baldwin, A. S. Wilson, and Mark Whittle. **319**, 84, 94-A3 (1987)
- WILSON, ANDREW S. A Radiative Bow Shock Wave (?) Driven by Nuclear Ejecta in a Seyfert Galaxy. Andrew S. Wilson and James S. Ulvestad. **319**, 105, 94-B11 (1987)
- WILSON, B. G. Reexamination of the Metal Contribution to Astrophysical Opacity. C. A. Iglesias, F. J. Rogers, and B. G. Wilson. **322**, L45, 145-D2 (1987)
- WILSON, J. R. Resonant Neutrino Oscillations and Stellar Collapse. G. M. Fuller, R. W. Mayle, J. R. Wilson, and D. N. Schramm. **322**, 795, 148-E3 (1987)
- WILSON, JAMES R. Neutrinos from Gravitational Collapse. Ron Mayle, James R. Wilson, and David N. Schramm. **318**, 288, 82-A11 (1987)
- WILSON, R. E. RW Comae Berenices. III. Light Curve Solution and Absolute Parameters. E. F. Milone, R. E. Wilson, and B. J. Hrivnak. **319**, 325, 96-E3 (1987)
- WILSON, ROBERT W. Filamentary Structure in the Orion Molecular Cloud. John Bally, William D. Langer, Antony A. Stark, and Robert W. Wilson. **312**, L45, 14-B12 (1987)
- The Structure and Dynamics of Bok Globule B335. Margaret A. Frerking, William D. Langer, and Robert W. Wilson. **313**, 320, 18-D10 (1987)
- Radio Observations of Carbon Monoxide toward Zeta Ophiuchi: Velocity Structure, Isotopic Abundances, and Physical Properties. William D. Langer, Alfred E. Glassgold, and Robert W. Wilson. **322**, 450, 142-G9 (1987)
- Galactic Center Molecular Clouds. I. Spatial and Spatial-Velocity Maps. John Bally, Antony A. Stark, Robert W. Wilson, and Christian Henkel. **65**, 13, 28-B2 (1987) (Abstr. in **319**, 1011, 106-A9)
- WILSON, T. L. Measurements of the ³He Abundance in the Interstellar Medium. T. M. Bania, Robert T. Rood, and T. L. Wilson. **323**, 30, 153-D3 (1987)
- WINDHORST, ROGIER A. 6 Centimeter Radio Source Counts and Spectral Index Studies Down to 0.1 Millijansky. R. Hank Donnelly, R. Bruce Partridge, and Rogier A. Windhorst. **321**, 94, 123-B9 (1987)
- WINGET, D. E. The Exotic Helium Variable PG 1346 + 082. M. A. Wood, D. E. Winget, R. E. Nather, Frederic V. Hessman, James Liebert, Donald W. Kurtz, F. Wesemael, and G. Wegner. **313**, 757, 25-B1 (1987)
- An Independent Method for Determining the Age of the Universe. D. E. Winget, C. J. Hansen, James Liebert, H. M. Van Horn, G. Fontaine, R. E. Nather, S. O. Kepler, and D. Q. Lamb. **315**, L77, 49-B1 (1987)
- Two Extreme Examples of Compact Pulsators: PG 1115 + 158 and PG 1351 + 489. D. E. Winget, R. E. Nather, and J. Allen Hill. **316**, 305, 53-C11 (1987)
- WINKLER, P. FRANK. High-Velocity Emission in Young Supernova Remnants: SN 1006 and SN 1572. Robert P. Kirshner, P. Frank Winkler, and Roger A. Chevalier. **315**, L135, 49-F3 (1987)
- WINTERS, R. R. Maxwellian-averaged Neutron Capture Cross Sections for ⁹⁹Tc and ⁹⁸Mo. R. R. Winters and R. L. Macklin. **313**, 808, 25-E10 (1987)
- WISE, MARK B. Interpretation of Large-Scale Deviations from the Hubble Flow. B. Grinstein, H. David Politzer, S.-J. Rey, and Mark B. Wise. **314**, 431, 34-C1 (1987)
- On the Validity of the Zel'dovich Approximation. Benjamin Grinstein and Mark B. Wise. **320**, 448, 114-C11 (1987)
- WIŚNIEWSKI, W. Z. see MAKINO, F., et al.
- WITEBSKY, CHRIS. Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. George F. Smoot, Marc Bershadoun, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Witebsky. **317**, L45, 78-A9 (1987)
- WITHBROE, GEORGE L. Solar Wind Diagnostics from Doppler-enhanced Scattering. Giancarlo Noci, John L. Kohl, and George L. Withbroe. **315**, 706, 48-D1 (1987)
- WITT, A. N. Ultraviolet Spectra of HH 1 and HH 2: Spatial Variations and the Continuum Problem. K. H. Böhm, Th. Bürke, A. C. Raga, E. W. Bruge, A. N. Witt, and R. Mundt. **316**, 349, 53-G7 (1987)
- The Unusual Dust-scattering Properties in the Reflection Nebula CED 201. A. N. Witt, R. C. Bohlin, T. P. Stecher, and S. M. Graff. **321**, 912, 134-E4 (1987)
- WITZEL, A. 1928 + 738: A Superluminal Source with Large-Scale Structure. K. J. Johnston, R. S. Simon, A. Eckart, P. Biermann, C. Schalinski, A. Witzel, and R. G. Strom. **313**, L85, 27-D11 (1987)
- WOLFE, A. M. The Effect of a Quasi-stellar Object on Its Host Galaxy: Dynamical and Physical Processes in the Interstellar Medium around a Quasi-stellar Object. C. A. Chang, A. V. R. Schiano, and A. M. Wolfe. **322**, 180, 139-G8 (1987)
- WOLFE, ARTHUR M. An Absorption-Line Survey of 32 QSOs at Red Wavelengths: Properties of the Mg II Absorbers. Kenneth M. Lanzetta, David A. Turnshek, and Arthur M. Wolfe. **322**, 739, 148-A2 (1987)
- WOLFIRE, M. G. Low-Mass, Pre-Main-Sequence Stars: The Infrared Emission from Circumstellar Dust. M. G. Wolfire and E. Churchwell. **315**, 315, 43-C14 (1987)
- WOLFIRE, MARK G. Conditions for the Formation of Massive Stars. Mark G. Wolfire and Joseph P. Cassinelli. **319**, 850, 104-C7 (1987)
- WOLSCZAN, A. The Drifting Subpulse Phenomenon Observed in Three Pulsars with Triple Profiles. T. H. Hankins and A. Wolsczan. **318**, 410, 83-D8 (1987)
- Interstellar Interferometry of the Pulsar PSR 1237 + 25. A. Wolsczan and J. M. Cordes. **320**, L35, 114-C11 (1987)
- WOOD, D. O. S. Solar System-Sized Condensations in the Orion Nebula. E. Churchwell, M. Felli, D. O. S. Wood, and M. Massi. **321**, 516, 127-F11 (1987)
- WOOD, K. S. Discovery of 5 Hz Quasi-periodic Oscillations in Cygnus X-2. J. P. Norris and K. S. Wood. **312**, 732, 11-A1 (1987)
- WOOD, M. A. The Exotic Helium Variable PG 1346 + 082. M. A. Wood, D. E. Winget, R. E. Nather, Frederic V. Hessman, James Liebert, Donald W. Kurtz, F. Wesemael, and G. Wegner. **313**, 757, 25-B1 (1987)

- WOOD, MATT A. Detection of Superhumps and Quasi-periodic Oscillations in the Light Curve of the Dwarf Nova SW Ursae Majoris. *Edward L. Robinson, Allen W. Shafter, J. Allen Hill, Matt A. Wood, and Janet A. Mattei*. **313**, 772, 25-C2 (1987)
- WOOD, P. A. D. X-Rays from the Radio Halo of M87. *E. D. Feigelson, P. A. D. Wood, E. J. Schreier, D. E. Harris, and M. J. Reid*. **312**, 101, 2-B5 (1987)
- WOOD, P. R. Angular Diameters and Fluxes of Magellanic Cloud Planetary Nebulae. II. High-Speed Direct Imaging. *P. R. Wood, S. J. Meatheringham, M. A. Dopita, and D. H. Morgan*. **320**, 178, 110-A11 (1987)
- The Ionization Effects of Shock Breakout in SN 1987A. *M. A. Dopita, S. J. Meatheringham, P. Nulsen, and P. R. Wood*. **322**, L85, 152-C5 (1987)
- WOOD, PETER R. New Evolutionary Relationships for Magellanic Cloud Planetary Nebulae. *Michael A. Dopita, Stephen J. Meatheringham, Peter R. Wood, B. Louise Webster, David H. Morgan, and Holland C. Ford*. **315**, L107, 49-D2 (1987)
- WOODEN, DIANE H. Observations of Infrared Emission from a Fast-moving Knot in Cassiopeia A. *Harriet L. Dinerstein, Daniel F. Lester, David M. Rank, Michael W. Werner, and Diane H. Wooden*. **312**, 314, 4-C11 (1987)
- WOODS, DAVID. The Luminosity-Velocity Diagram: A New Distance Estimator for Spiral Galaxies? *Barry F. Madore and David Woods*. **323**, L25, 158-B13 (1987)
- WOODWARD, JAMES F. Pulsar Magnetogyro Ratios and Pulsar Evolution. IV. Peaks in the Pulse Period Number Density Distribution and Short-Period Evolution. *James F. Woodward*. **316**, 743, 60-C1 (1987)
- WOODY, D. VLBI Structure of 3C 84 at 89 GHz. *D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman*. **322**, 74, 138-F11 (1987)
- WOODY, D. P. Molecular Gas in the Starburst Nucleus of M82. *K. Y. Lo, K. W. Cheung, C. R. Masson, T. G. Phillips, S. L. Scott, and D. P. Woody*. **312**, 574, 9-B7 (1987)
- Molecular Spiral Structure in M51. *K. Y. Lo, R. Ball, C. R. Masson, T. G. Phillips, S. Scott, and D. P. Woody*. **317**, L63, 78-B11 (1987)
- CO Maps of the OMC-1 Outflow. *C. R. Masson, K. Y. Lo, T. G. Phillips, A. I. Sargent, N. Z. Scoville, and D. P. Woody*. **319**, 446, 98-A11 (1987)
- A Possible Protostar near HH 7-11. *E. N. Grossman, C. R. Masson, A. I. Sargent, N. Z. Scoville, S. Scott, and D. P. Woody*. **320**, 356, 112-A1 (1987)
- WOOSLEY, S. E. Supernova 1987A in the Large Magellanic Cloud: The Explosion of a $\sim 20 M_{\odot}$ Star Which Has Experienced Mass Loss? *S. E. Woosley, P. A. Pinto, P. G. Martin, and Thomas A. Weaver*. **318**, 664, 88-B11 (1987)
- WOOTEN, ALWYN. L1689N: Misalignment between a Bipolar Outflow and a Magnetic Field. *Alwyn Wooten and R. B. Loren*. **317**, 220, 66-D1 (1987)
- WORDEN, SIMON P. Magnetic Field Measurements on the Sun and Implications for Stellar Magnetic Field Observations. *Wei-Hsin Sun, Mark S. Giampapa, and Simon P. Worden*. **312**, 930, 13-B1 (1987)
- WORLEY, A. Ariel 6 Measurements of the Fluxes of Ultraheavy Cosmic Rays. *P. H. Fowler, R. N. F. Walker, M. R. W. Masheder, R. T. Moses, A. Worley, and A. M. Gay*. **314**, 739, 37-F7 (1987)
- WORRALL, D. M. X-Ray Studies of Quasars with the EINSTEIN OBSERVATORY. IV. X-Ray Dependence on Radio Emission. *D. M. Worrall, P. Giommi, H. Tananbaum, and G. Zamorani*. **313**, 596, 23-C9 (1987)
- Luminosity Dependence in the Ratio of X-Ray to Infrared Emission of QSOs. *D. M. Worrall*. **318**, 188, 81-A4 (1987)
- WRIGHT, EDWARD L. Source Counts in the Chronometric Cosmology. *Edward L. Wright*. **313**, 551, 22-G1 (1987)
- The Red/Infrared Evolution in Galaxies—Effects of the Stars on the Asymptotic Giant Branch. *Arati Chokshi and Edward L. Wright*. **319**, 44, 93-E1 (1987)
- Long-Wavelength Absorption by Fractal Dust Grains. *Edward L. Wright*. **320**, 818, 118-F9 (1987)
- WRIGHT, GILLIAN S. Infrared Spectroscopy of the Supernova Remnant IC 443. *James R. Graham, Gillian S. Wright, and Andrew J. Longmore*. **313**, 847, 26-A7 (1987)
- WRIGHT, M. C. H. Aperture Synthesis Maps of HDO Emission in Orion-KL. *R. L. Plambeck and M. C. H. Wright*. **317**, L101, 78-E4 (1987)
- Aperture Synthesis Observations of the Circumnuclear Ring in the Galactic Center. *R. Güsten, R. Genzel, M. C. H. Wright, D. T. Jaffe, J. Stutzki, and A. I. Harris*. **318**, 124, 80-C8 (1987)
- VLBI Structure of 3C 84 at 89 GHz. *D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman*. **322**, 74, 138-F11 (1987)
- WROBEL, J. M. 92 Centimeter VLBI Structure of the Elliptical Galaxy MCG 5-4-18: Erratum. *J. M. Wrobel and R. S. Simon*. **316**, 858, 61-D14 (1987) (Orig. paper in **309**, 593, 127-F6)
- WU, CHI-CHAO. Recurrent Episodic Mass Loss in a B2e Star: 66 Ophiuchi, 1982-1985. *C. A. Grady, George Sonneborn, Chi-Chao Wu, and H. F. Henrichs*. **65**, 673, 39-A2 (1987) (Abstr. in **322**, 1077, 151-G3)
- WU, F. Static Current-Sheet Models of Quiescent Prominences. *F. Wu and B. C. Low*. **312**, 431, 5-E3 (1987)
- Stability of Current-Sheet Models of Quiescent Prominences and Equatorial Disks. *F. Wu*. **320**, 418, 112-E8 (1987)
- WUEST, C. see SVOBODA, R. et al.
- WYCKOFF, S. Ground-based Constraints on the H_2O^+/CO^+ Abundance Ratio and Dust Impact Rate in Comet P/Giacobini-Zinner: Comparison with the ICE Spacecraft Results. *R. Mark Wagner, Barry L. Lutz, and S. Wyckoff*. **322**, 544, 143-G9 (1987)
- WYNN-WILLIAMS, C. G. IRAS 23060 + 0505: A Highly Obscured $3.3 \times 10^{12} L_{\odot}$ Active Galaxy. *G. J. Hill, C. G. Wynn-Williams, and E. E. Becklin*. **316**, L11, 56-A14 (1987)
- WYSE, ROSEMARY F. G. Bimodal Star Formation: Constraints from the Solar Neighborhood. *Rosemary F. G. Wyse and J. Silk*. **313**, L11, 21-A13 (1987)
- Bimodal Star Formation: Constraints from Galaxy Colors at High Redshift. *Rosemary F. G. Wyse and Joseph Silk*. **319**, L1, 100-A4 (1987)
- On the Origin of Dwarf Galaxies. *Joseph Silk, Rosemary F. G. Wyse, and G. A. Shields*. **322**, L59, 152-A9 (1987)
- YAHIL, A. Mass, Luminosity, and Line Width Relations of Galactic Molecular Clouds. *P. M. Solomon, A. R. Rivolo, J. Barrett, and A. Yahil*. **319**, 730, 103-A8 (1987)
- YAMAMOTO, SATOSHI. The Laboratory Observation of the $J = 1-0$, $K = 0$ Transition of the H_2S^+ Ion. *Shuji Saito, Satoshi Yamamoto, and Takayoshi Amano*. **314**, L27, 33-C14 (1987)
- Laboratory Detection and Astronomical Identification of a New Free Radical, $CCS(^3\Sigma^-)$. *Shuji Saito, Kentarou Kawaguchi, Satoshi Yamamoto, Masatoshi Ohishi, Hiroko Suzuki, and Norio Kaifu*. **317**, L115, 78-F3 (1987)
- Laboratory Detection of a New Carbon-Chain Molecule C_3S and Its Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, Kentarou Kawaguchi, Norio Kaifu, Hiroko Suzuki, and Masatoshi Ohishi*. **317**, L119, 78-F7 (1987)
- Laboratory and Astronomical Detection of the Cyclic H_3H Radical. *Satoshi Yamamoto, Shuji Saito, Masatoshi Ohishi, Hiroko Suzuki, Shin-ichi Ishikawa, Norio Kaifu, and Akinori Murakami*. **322**, L55, 145-D12 (1987)
- Laboratory Microwave Spectroscopy of the Vibrational Satellites for the ν_7 and $2\nu_7$ States of C_2H and Their Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, M. Güélin, J. Cernicharo, Hiroko Suzuki, and Masatoshi Ohishi*. **323**, L149, 164-E8 (1987)
- YANG, S. Discovery of High-Degree Nonradial Oscillations in Rapidly Rotating δ Scuti Stars? *G. A. H. Walker, S. Yang, and G. G. Fahlman*. **320**, L139, 121-E9 (1987)
- The Primary Orbit and Absorption Lines of HDE 226868 (Cygnus X-1). *Z. Ninkov, G. A. H. Walker, and S. Yang*. **321**, 425, 126-G4 (1987)
- The He II $\lambda 4686$ and H α Emission Lines of Cygnus X-1. *Z. Ninkov, G. A. H. Walker, and S. Yang*. **321**, 438, 127-A3 (1987)
- YANNY, BRIAN. Forbidden [O II] and [O III] Emission 29" from a QSO Absorption-Line Region. *Brian Yanny, Don Hamilton, R. A. Schommer, T. B. Williams, and D. G. York*. **323**, L19, 158-B7 (1987)
- YATOM, H. Theoretical Non-Maxwellian Particle Velocity Distribution Functions for Spherically Symmetric Solar Wind-like Plasma Systems and Consequences. II. The Case of Large Thermal Anisotropy and Nine Moments Description for Each Species. *S. Cuperman, H. Yatom, M. Dryer, and D. Lewis*. **314**, 404, 32-E11 (1987)
- YAU, HORNG-TZER. A Rigorous Examination of the Chandrasekhar Theory of Stellar Collapse. *Elliott H. Lieb and Horng-Tzer Yau*. **323**, 140, 154-E12 (1987)
- YEE, H. K. C. Surveys of Fields around Quasars. IV. Luminosity of Galaxies at $z \approx 0.6$ and Preliminary Evidence for the Evolution of the Environment of Radio-loud Quasars. *H. K. C. Yee and Richard F. Green*. **319**, 28, 93-C12 (1987)
- The Late-Type Stellar Content of NGC 55. *Christopher J. Pritchett, Harvey B. Richer, David Schade, Dennis Crabtree, and H. K. C. Yee*. **323**, 79, 154-A3 (1987)
- YEPES, G. Antimatter and Light Element Yields: Could Dark Matter be Baryonic? *R. Dominguez-Tenreiro and G. Yepes*. **317**, L1, 71-A4 (1987)
- YIN, Q. F. The Relationship between Stellar Population and Radio

- Continuum Emission in Spiral Galaxies. *David Burstein, J. J. Condon, and Q. F. Yin.* **315**, L99, 49-C8 (1987)
- A 1.49 GHz Supplementary Atlas of Spiral Galaxies with *H*-Magnitudes. *J. J. Condon, Q. F. Yin, and David Burstein.* **65**, 543, 36-G1 (1987) (Abstr. in **322**, 1075, 151-G1)
- YORK, D. G. High-Resolution Spectroscopy of the $z = 1.79$ Absorption-Line System toward B2 1225 + 317. *Jill Bechtold, Richard F. Green, and D. G. York.* **312**, 50, 1-E5 (1987)
- The Local Interstellar Medium. VII. The Local Interstellar Wind and Interstellar Material in Front of the Nearby Star α Ophiuchi. *P. C. Frisch, D. G. York, and J. R. Fowler.* **320**, 842, 119-A10 (1987)
- Forbidden [O II] and [O III] Emission 29'' from a QSO Absorption-Line Region. *Brian Yanny, Don Hamilton, R. A. Schommer, T. B. Williams, and D. G. York.* **323**, L19, 158-B7 (1987)
- YORK, DONALD G. Observations of Weak C IV Absorption toward the QSOs 2000-330 and 2126-158. *David M. Meyer and Donald G. York.* **315**, L5, 45-A8 (1987)
- Observations of Ni II Absorption at $z = 2.811$ toward the QSO PKS 0582 - 250. *David M. Meyer and Donald G. York.* **319**, L45, 107-B13 (1987)
- YOSHIOKA, SATOSHI. On the Origin of Possible Deviation from the Blackbody Spectrum of the Cosmic Microwave Background Radiation: Inverse Compton Hypothesis Based upon the Explosion Scenario. *Satoshi Yoshioka and Satoru Ikeuchi.* **323**, L7, 158-A10 (1987)
- YOU, J. H. New Considerations on the Broad-Line Regions of Quasars. *J. H. You and F. H. Cheng.* **322**, 174, 139-G2 (1987)
- YOUNG, ARTHUR. The Incidence of Close Binaries among Stars of Low Mass: Astrophysical Binaries. *Arthur Young, Sina Sadjadi, and Eugene Harlan.* **314**, 272, 31-B1 (1987)
- Duplicity among Stars with Strong Chromospheric Ca II Emission Lines: A Statistical Survey. *Arthur Young, Richard A. Mielbrecht, and Helmut A. Abt.* **317**, 787, 74-F1 (1987)
- Spectroscopy of the Optical Photosphere of the Hot Pulsating Star BW Vulpeculae. *Ingemar Furenlid, Arthur Young, Thomas Meylan, Chester Haag, and Greg Crinklaw.* **319**, 264, 95-G9 (1987)
- YOUNG, J. S. Detection of CO(1 \rightarrow 0) Emission and Optical Imaging of the Seyfert Galaxy/QSO Markarian 231. *D. B. Sanders, J. S. Young, N. Z. Scoville, B. T. Soifer, and G. E. Danielson.* **312**, L5, 7-A8 (1987)
- YOUNG, JUDITH S. The CO Contents of Dwarf Irregular Galaxies. *Linda J. Tacconi and Judith S. Young.* **322**, 681, 147-C1 (1987)
- YOUNG, K. CO Emission from Centaurus A. *T. G. Phillips, B. N. Ellison, J. B. Keene, R. B. Leighton, R. J. Howard, C. R. Masson, D. B. Sanders, B. Veidt, and K. Young.* **322**, L73, 152-B8 (1987)
- YOUNG, PETER. High-Resolution Spectra of 24 Low-Redshift QSOs: The Properties of Mg II Absorption Systems. *David Tytler, A. Boksenberg, Wallace L. W. Sargent, Peter Young, and Daniel Kunth.* **64**, 667, 27-B8 (1987) (Abstr. in **318**, 945, 91-C10)
- YU, T. L. A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. *M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengston, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan.* **313**, 920, 26-G3 (1987)
- Laboratory Study of the Spectrum of Highly Ionized Calcium in the 100-250 Å Range Applied to Solar Flare Diagnostics. *S. Lippmann, M. Finkenthal, L. K. Huang, H. W. Moos, B. C. Stratton, T. L. Yu, A. K. Bhatia, and W. L. Hodge.* **316**, 819, 61-A11 (1987)
- YUN, MIN SU. Molecular Clouds and Cloud Cores in the Inner Galaxy. *N. Z. Scoville, Min Su Yun, D. P. Clemens, D. B. Sanders, and W. H. Waller.* **63**, 821, 13-G12 (1987) (Abstr. in **314**, 832, 38-F8)
- YUSEF-ZADEH, F. Structural Details of the Sagittarius A Complex: Evidence for a Large-Scale Poloidal Magnetic Field in the Galactic Center Region. *F. Yusef-Zadeh and M. Morris.* **320**, 545, 115-D12 (1987)
- The Large-Scale Radio Structure of R Aquarii. *J. M. Hollis, M. Kafatos, A. G. Michalitsianos, R. J. Oliveren, and F. Yusef-Zadeh.* **321**, L55, 129-F6 (1987)
- YUSEF-ZADEH, FARHAD. The Linear Filaments of the Radio Arc near the Galactic Center. *Farhad Yusef-Zadeh and Mark Morris.* **322**, 721, 147-F7 (1987)
- ZAMORANI, G. X-Ray Studies of Quasars with the *EINSTEIN OBSERVATORY*. IV. X-Ray Dependence on Radio Emission. *D. M. Worrall, P. Giommi, H. Tananbaum, and G. Zamorani.* **313**, 596, 23-C9 (1987)
- ZAMORANI, GIOVANNI. X-Ray Background, Discrete Sources, and Diffuse Processes. *Riccardo Giacconi and Giovanni Zamorani.* **313**, 20, 15-B12 (1987)
- ZAVATTI, T. Deconvolution of Elliptical Nuclei of Galaxies: Application to M81: Erratum. *O. Bendinelli, G. Parmeggiani, and T. Zavatti.* **315**, 408, 44-C14 (1987) (Orig. paper in **308**, 611, 115-E14)
- ZDZIARSKI, ANDRZEJ A. Effects of Electron-Positron Pair Opacity for Spherical Accretion onto Black Holes. *Alan P. Lightman, Andrzej A. Zdziarski, and Martin J. Rees.* **315**, L113, 49-D8 (1987)
- Pair Production and Compton Scattering in Compact Sources and Comparison to Observations of Active Galactic Nuclei. *Alan P. Lightman and Andrzej A. Zdziarski.* **319**, 643, 102-A7 (1987)
- ZEILIK, M. An Analysis of the Light Curves of Short-Period RS Canum Venaticorum Stars: Starspots and Fundamental Properties. *E. Budiding and M. Zeilik.* **319**, 827, 104-A12 (1987)
- ZENSUS, J. A. Evolution of 3C 273 at 10.7 GHz. *M. H. Cohen, J. A. Zensus, J. A. Biretta, G. Comoretto, P. Kaufmann, and Z. Abraham.* **315**, L89, 49-B11 (1987)
- ZHANG, E.-H. The Eclipses of Cataclysmic Variables. II. U Geminorum. *E.-H. Zhang and Edward L. Robinson.* **321**, 813, 133-D8 (1987)
- ZHANG, HONGLIN. Collision Rates for Excitation of Helium-like Ions with Inclusion of Resonance Effects. *Honglin Zhang and Douglas H. Sampson.* **63**, 487, 8-D5 (1987) (Abstr. in **312**, 967, 13-E8)
- ZHENG, WEI. Emission-Line Variability and the Broad-Line Region of Quasi-stellar Objects. I. Time Scales and Photon Densities. *Wei Zheng, E. Margaret Burbidge, Harding E. Smith, Ross D. Cohen, and Steven E. Bradley.* **322**, 164, 139-F5 (1987)
- ZIMMERMAN, R. L. Inhomogeneous Cosmology. III. Primordial Gravitational Waves and Dust. *P. J. Adams, R. W. Hellings, and R. L. Zimmerman.* **318**, 1, 79-A5 (1987)
- ZIMMERMANN, H. U. Characteristics of Old Neutron Stars in Dense Interstellar Clouds. *H. Böhringer, G. E. Morfill, and H. U. Zimmermann.* **313**, 218, 17-D1 (1987)
- ZINNER, E. K. ^{16}O Excesses in Murchison and Murray Hibonites: A Case Against a Late Supernova Injection Origin of Isotopic Anomalies in O, Mg, Ca, and Ti. *A. J. Fahey, J. N. Goswami, K. D. McKeegan, and E. K. Zinner.* **323**, L91, 158-G5 (1987)
- ZIURYS, L. M. Observations of SiO toward OMC-1: A New Outflow Source 1.75 South of Orion-KL? *L. M. Ziurys and P. Friberg.* **314**, L49, 39-B12 (1987)
- Detection of Interstellar PN: The First Phosphorus-bearing Species Observed in Molecular Clouds. *L. M. Ziurys.* **321**, L81, 130-A2 (1987)
- ZUCKERMAN, B. A Search for Brown Dwarfs and Late M Dwarfs in the Hyades and the Pleiades. *B. Zuckerman and E. E. Becklin.* **319**, L99, 107-F9 (1987)
- Structure of a Possible Circumbinary Disk around T Tauri. *D. A. Weintraub, C. R. Masson, and B. Zuckerman.* **320**, 336, 111-F9 (1987)
- ZWEIBEL, ELLEN G. The Formation of Current Sheets in the Solar Atmosphere. *Ellen G. Zweibel and He-Sheng Li.* **312**, 423, 5-D9 (1987)
- Propagation of Compressive Waves through Fibril Magnetic Fields. *T. J. Bogdan and Ellen G. Zweibel.* **312**, 444, 5-F10 (1987)
- The Structure and Dissipation of Forced Current Sheets in the Solar Atmosphere. *Tzihong Chiueh and Ellen G. Zweibel.* **317**, 900, 76-A7 (1987)
- The Scattering of Alfvén Waves by Density Fluctuations. *He-Sheng Li and Ellen G. Zweibel.* **322**, 248, 140-E8 (1987)
- ZYLSTRA, G. Apsidal Advance in Vela X-1. *J. E. Deeter, P. E. Boynton, F. K. Lamb, and G. Zylstra.* **314**, 634, 36-E1 (1987)

1

2

3

7

1

SUBJECT HEADING TABLE OF CONTENTS

Absolute Magnitudes: *see* Stars: Luminosities 140
 Absorption: *see* Opacities 118
 Abundances 81
 Addenda: *see* Errata and Addenda 87
 Analytical Methods *no listings*
 Announcements: *see* Notices 117
 Asteroids *no listings*
 Astrometry 81
 Atomic Processes 81
 Autoionization: *see* Atomic Processes 81

Black Holes 81
 BL Lacertae Objects 82

Ca II Emission 82
 Cataclysmic Stars: *see* Stars: Novae 142;
 Stars: U Geminorum 146
 Celestial Mechanics *no listings*
 Cluster-Type Variables: *see* Stars: RR Lyrae 144
 Clusters: Associations 82
 Clusters: Globular 82
 Clusters: Open 83
 Comets 83
 Convection 84
 Cool Stars: *see* Stars: Late-Type 139
 Cosmic Background Radiation 84
 Cosmic Rays: Abundances 84
 Cosmic Rays: General 84
 Cosmology 85

Dark Matter *no listings*
 Dense Matter 86
 Deuterium 86
 Diffusion 86
 Double Stars: *see* Stars: Binaries 130;
 Stars: Visual Multiples 147

Early Universe 86
 Earth: Airglow *no listings*
 Earth: Atmosphere *no listings*
 Earth: Aurorae *no listings*
 Earth: General 87
 Editorials: *see* Notices 117
 Elementary Particles 87
 Equation of State 87
 Equations: *see* Analytical Methods *no listings*;
 Numerical Methods 117
 Errata and Addenda 87
 Excitation and Ionization: *see* Atomic Processes 81

f-Values: *see* Transition Probabilities 152
 Forbidden Lines *no listings*
 see also Atomic Processes 81
 Functions: Numerical Methods: *see* Analytical Methods *no listings*;
 Numerical Methods 117

Fundamental Constants *no listings*

Galaxies: Abundances 87
 Galaxies: Clustering 87
 Galaxies: Distances 89
 Galaxies: Evolution 89
 Galaxies: Formation 89
 Galaxies: General 89
 Galaxies: Individual 90
 By Messier Number 90
 By NGC Number 90
 By Other Designation: Names 91
 By Other Designation: Alphanumeric 91
 Galaxies: Interactions 91
 Galaxies: Intergalactic Medium 91
 Galaxies: Internal Motions 92
 Galaxies: Interstellar Matter 92
 Galaxies: Jets 92
 Galaxies: Local Group 93
 Galaxies: Magellanic Clouds 93
 Galaxies: Nuclei 93
 Galaxies: Photometry 95
 Galaxies: Redshifts 95
 Galaxies: Seyfert 96
 Galaxies: Stellar Content 96
 Galaxies: Structure 97
 Galaxies: The Galaxy 98
 Galaxies: X-Rays 99
 Galaxy, The: *see* Galaxies: The Galaxy 98
 Gamma-Rays: Bursts 99
 Gamma-Rays: General 99
 Gas Dynamics: *see* Hydrodynamics 101
 Gravitation 100
 Gravitational Lenses 101

Hydrodynamics 101
 Hydromagnetic 101
 Hyperfine Structure *no listings*
 see also Atomic Processes 81
 H II Regions: *see* Nebulae: H II Regions 113

Image Processing *no listings*
 Infrared: General 102
 Infrared: Source 102
 Infrared: Spectra 104
 Instabilities 105
 Instruments 105
 Interferometry 105
 Intergalactic Medium 105
 Interplanetary Medium 105
 Interstellar: Abundances 106
 Interstellar: Grains 106
 Interstellar: Magnetic Fields 107
 Interstellar: Matter 107
 Interstellar: Molecules 108
 Ionization: *see* Atomic Processes 81

- Laboratory Spectra 110
 Line Formation 110
 Line Identifications 110
 Line Profiles 111
 Luminosity Function 111
- Magnetic Fields 111
 Magnetohydrodynamics: *see* Hydromagnetic 101
 Masers 111
 Mass-Luminosity Relation *no listings*
 Metal-Poor Stars: *see* Stars: Weak-Line 147
 Meteors and Meteorites 112
 Microwave Radiation: *see* Radio Sources 125
 Mira Variables: *see* Stars: Long-Period Variables 140
 Molecular Processes 112
 Moon *no listings*
- Nebulae: Abundances 113
 Nebulae: Crab Nebula 113
 Nebulae: General 113
 Nebulae: H II Regions 113
 Nebulae: Individual 114
 By Messier Number 114
 By NGC Number 114
 By Other Designation: Names 114
 By Other Designation: Alphanumeric 114
 Nebulae: Internal Motions 115
 Nebulae: Orion Nebula 115
 Nebulae: Planetary 115
 Nebulae: Reflection 115
 Nebulae: Supernova Remnants 116
 Neutrinos 116
 Notices 117
 Nuclear Reactions 117
 Nucleosynthesis 117
 Numerical Methods 117
- Occultations 118
 Opacities 118
- Particle Acceleration 118
 Photometry 118
 Planets: Abundances 119
 Planets: Atmospheres 119
 Planets: Charged Particles *no listings*
 Planets: Formation 119
 Planets: General 119
 Planets: Interiors 119
 Planets: Jupiter 119
 Planets: Limb Darkening *no listings*
 Planets: Magnetospheres 119
 Planets: Mars *no listings*
 Planets: Mercury *no listings*
 Planets: Neptune *no listings*
 Planets: Pluto *no listings*
 Planets: Radio Radiation 119
 Planets: Satellites 119
 Planets: Saturn 119
 Planets: Spectra 119
 Planets: Uranus 119
 Planets: Venus *no listings*
 Plasmas 119
 Polarization 120
 Proper Motions: *see* Stars: Proper-Motion *no listings*;
 Stars: Stellar Dynamics 144
 Pulsars 121
- Quantum Mechanics 121
 Quasars 121
- Radar Astronomy 123
 Radial Velocities 123
 Radiation Mechanisms 123
 Radiative Transfer 124
 Radio Sources: Extended 125
 Radio Sources: Galaxies 125
 Radio Sources: General 125
 Radio Sources: Identifications 126
 Radio Sources: Lines 126
 Radio Sources: Spectra 126
 Radio Sources: 21 cm Radiation 126
 Radio Sources: Variable 126
 Relativity 126
 Rotation 127
- Shock Waves 127
 Sky Photographs 128
 Solar System: General 128
 Spectrophotometry 128
 Spiral Structure: *see* Galaxies: Structure 97
 SS Cygni Stars: *see* Stars: U Geminorum 146
 Stars: Abundances 128
 Stars: Accretion 129
 Stars: Atmospheres 130
 Stars: Ba II 130
 Stars: Be 130
 Stars: β Cephei 130
 Stars: Binaries 130
 Stars: Carbon 132
 Stars: Catalogs 132
 Stars: Cepheids 132
 Stars: Chromospheres 132
 Stars: Circumstellar Shells 132
 Stars: Collapsed 133
 Stars: Combination Spectra 133
 Stars: Coronae 133
 Stars: δ Scuti *no listings*
 Stars: Diameters 133
 Stars: Dwarf Novae 133
 Stars: Early-Type 133
 Stars: Eclipsing Binaries 134
 Stars: Emission-Line 134
 Stars: Evolution 134
 Stars: Faint Blue *no listings*
 Stars: Flare 135
 Stars: Formation 135
 Stars: High-Velocity 136
 Stars: Horizontal Branch 136
 Stars: Hydrogen Deficient 136
 Stars: Individual 136
 By Constellation Name 136
 By Bright Star Number 138
 By Henry Draper Number 138
 By Other Designations: Names 138
 By Other Designations: Alphanumeric 138
 Stars: Interiors 139
 Stars: Late-Type 139
 Stars: Limb Darkening *no listings*
 Stars: Long-Period Variables 140
 Stars: Luminosities 140
 Stars: Magnetic 140
 Stars: Massive 140
 Stars: Mass Loss 140

- Stars: Metallic-Line 141
- Stars: Neutron 141
- Stars: Novae 142
- Stars: Of-Type 142
- Stars: Peculiar A 142
- Stars: Population II 142
- Stars: Pre-Main-Sequence 142
- Stars: Proper-Motion *no listings*
- Stars: Pulsation 143
- Stars: Radio Radiation 143
- Stars: R Coronae Borealis *no listings*
- Stars: Rotation 144
- Stars: RR Lyrae 144
- Stars: RV Tauri 144
- Stars: S-Type 144
- Stars: Semiregular Variables 144
- Stars: Short-Period Variables *no listings*
- Stars: Spectral Classification 144
- Stars: Spectrum Variables *no listings*
- Stars: Stellar Dynamics 144
- Stars: Stellar Statistics 145
- Stars: Subdwarfs 145
- Stars: Supergiants 145
- Stars: Supernovae 145
- Stars: Symbiotic 146
- Stars: T Tauri 146
- Stars: U Geminorum 146
- Stars: Variables 146
- Stars: Visual Multiples 147
- Stars: Weak-Line 147
- Stars: White Dwarfs 147
- Stars: Winds 148
- Stars: Wolf-Rayet 148
- Stars: W Ursae Majoris 148
- Stars: X-Rays 148
- Sun: Abundances 149
- Sun: Activity 149
- Sun: Atmosphere 149
- Sun: Atmospheric Motions 149
- Sun: Chromosphere 149
- Sun: Corona 149
- Sun: Eclipses 150
- Sun: Faculae 150
- Sun: Flares 150
- Sun: General 150
- Sun: Granulation 150
- Sun: Interior 150
- Sun: Limb Darkening 151
- Sun: Magnetic Fields 151
- Sun: Oscillations 151
- Sun: Plages 151
- Sun: Prominences 151
- Sun: Radio Radiation 151
- Sun: Rotation 152
- Sun: Solar Wind 152
- Sun: Spectra 152
- Sun: Spectroheliograms *no listings*
- Sun: Sunspots 152
- Sun: Transition Region 152
- Sun: X-Rays 152
- Symbiotic Stars: *see* Stars: Combination Spectra 133
- Synchrotron Radiation: *see* Radiation Mechanisms 123
- 3° Cosmic Radiation: *see* Cosmic Background Radiation 84
- Transition Probabilities 152
- Turbulence 153
- T Tauri Stars: *see* Stars: Pre-Main-Sequence 142
- Ultraviolet: General 153
- Ultraviolet: Spectra 153
- Wave Motions 154
- W Virginis Stars: *see* Stars: Cepheids 132
- X-Rays: Binaries 154
- X-Rays: Bursts 155
- X-Rays: General 155
- X-Rays: Sources 156
- X-Rays: Spectra 156
- Zeeman Effect *no listings*
- Zodiacal Light 157

1

2

3

7

1

SUBJECT INDEX

Abundances

- Large Negative ^{50}Ti Anomalies in Refractory Inclusions from the Murchison Carbonaceous Chondrite: Evidence for Incomplete Mixing of Neutron-rich Supernova Ejecta into the Solar System. *Richard W. Hinton, Andrew M. Davis, and Debra E. Scatena-Wachel*. **313**, 420, 19-E12 (1987)
- Comet Halley: OH Absorption of Galactic Background Radio Sources. *E. Bajaja, E. M. Arnal, J. C. Cerosimo, F. R. Colomb, M. C. Martin, J. Mazzaro, R. Morras, J. C. Olalde, W. G. L. Poppel, A. M. Silva, I. F. Mirabel, and V. Boriakoff*. **313**, 906, 26-F2 (1987)
- Supernovae 1983i and 1983v: Evidence for Abundance Variations in Type Ib Supernovae. *J. C. Wheeler, R. P. Harkness, E. S. Barker, A. L. Cochran, and D. Wills*. **313**, L69, 27-C11 (1987)
- Neutron Capture Nucleosynthesis during Core Helium Burning in Massive Stars. *N. Prantzos, M. Arnould, and J.-P. Arcoragi*. **315**, 209, 42-C6 (1987)
- Observations of Weak C IV Absorption toward the QSOs 2000-330 and 2126-158. *David M. Meyer and Donald G. York*. **315**, L5, 45-A8 (1987)
- Fluorescence Efficiency Factors for Ionized Water Vapor. *Barry L. Lutz*. **315**, L147, 49-G2 (1987)
- Metal-enhanced Galactic Winds. II. Radiative Cooling and Pressure Effects. *J. Patricia Vader*. **317**, 128, 65-C14 (1987)
- Observations of Ni II Absorption at $z = 2.811$ toward the QSO PKS 0582 - 250. *David M. Meyer and Donald G. York*. **319**, L45, 107-B13 (1987)
- Chemical Condensation in the Outflowing Matter from the Proto-Sun and Its Application to Meteorites. *B. M. P. Trivedi*. **320**, 430, 112-F11 (1987)
- On the Origin of the Solar System s-Process Abundances. *Robert A. Malaney and Arnold I. Boothroyd*. **320**, 866, 119-C7 (1987)
- Ground-based Constraints on the $\text{H}_2\text{O}^+/\text{CO}^+$ Abundance Ratio and Dust Impact Rate in Comet P/Giacobini-Zinner: Comparison with the ICE Spacecraft Results. *R. Mark Wagner, Barry L. Lutz, and S. Wyckoff*. **322**, 544, 143-G9 (1987)
- Nuclear Chronometers from the r-Process and the Age of the Galaxy. *John J. Cowan, F.-K. Thielemann, and J. W. Truran*. **323**, 543, 160-F1 (1987)
- ^{16}O Excesses in Murchison and Murray Hibonites: A Case Against a Late Supernova Injection Origin of Isotopic Anomalies in O, Mg, Ca, and Ti. *A. J. Fahey, J. N. Goswami, K. D. McKeegan, and E. K. Zinner*. **323**, L91, 158-G5 (1987)
- ## Astrometry
- The Progenitor of SN 1987A: Spatially Resolved Ultraviolet Spectroscopy of the Supernova Field. *George Sonneborn, Bruce Altner, and Robert P. Kirshner*. **323**, L35, 158-C7 (1987)
- ## Atomic Processes
- O $\lambda 7774$ Diagnostic for Quiescent Prominences. *Nancy S. Brickhouse and Donald A. Landman*. **313**, 463, 20-A13 (1987)
- Effective Collision Strengths for Electron Impact Excitation in S II. *S. Tayal, J. W. Henry, and S. Nakazaki*. **313**, 487, 20-C10 (1987)
- A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. *M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengtson, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan*. **313**, 920, 26-G3 (1987)
- Effects of Electron-Positron Pair Opacity for Spherical Accretion onto Black Holes. *Alan P. Lightman, Andrzej A. Zdziarski, and Martin J. Rees*. **315**, L113, 49-D8 (1987)
- Laboratory Study of the Spectrum of Highly Ionized Calcium in the 100-250 Å Range Applied to Solar Flare Diagnostics. *S. Lippmann, M. Finkenthal, L. K. Huang, H. W. Moos, B. C. Stratton, T. L. Yu, A. K. Bhatia, and W. L. Hodge*. **316**, 819, 61-A11 (1987)
- Resonant Raman-Cyclotron Scattering in Very Strong Magnetic Fields. *Edouard Miska and Dominique Miska*. **317**, 282, 67-A7 (1987)
- Viscosity of Dense Matter. *Naoki Itoh, Yasuharu Kohyama, and Hideo Tekeuchi*. **317**, 733, 74-A13 (1987)
- Ne IX Emission-Line Ratios in Solar Active Regions. *F. P. Keenan, D. L. McKenzie, S. M. McCann, and A. E. Kingston*. **318**, 926, 91-B2 (1987)
- Stokes Profile Analysis and Vector Magnetic Fields. III. Extended Temperature Minima of Sunspot Umbrae as Inferred from Stokes Profiles of Mg I $\lambda 4571$. *B. W. Lites, A. Skumanich, D. E. Rees, G. A. Murphy, and M. Carlsson*. **318**, 930, 91-B6 (1987)
- Effect of Ion Correlations on Free-Free Opacities. *N. R. Dagdeviren and S. E. Koonin*. **319**, 192, 95-B3 (1987)
- Statistical Mechanics of Partially Ionized Stellar Plasmas: The Planck-Larkin Partition Function, Polarization Shifts, and Simulations of Optical Spectra. *Werner Däppen, Lawrence Anderson, and Dimitri Mihalas*. **319**, 195, 95-B6 (1987)
- Emission-Line Ratios for O III in Gaseous Nebulae and a Comparison between Theory and Observation. *F. P. Keenan and K. M. Aggarwal*. **319**, 403, 97-E7 (1987)
- The (C III $\lambda 1909/\text{Si III } \lambda 1892)$ Ratio as a Diagnostic for Planetary Nebulae and Symbiotic Stars. *Walter A. Feibelman and Lawrence H. Aller*. **319**, 407, 97-E11 (1987)
- Observation of Nonthermal Energy Distributions during the Impulsive Phase of Solar Flares. *J. F. Seely, U. Feldman, and G. A. Doschek*. **319**, 541, 99-B9 (1987)
- Quantized Synchrotron Radiation in Strong Magnetic Fields. *Alice K. Harding and Robert Preece*. **319**, 939, 105-C1 (1987)
- Electron Excitation of Fine-Structure Transitions within the Ground $3s^2 3p^3$ Configuration in Fe XII. *S. S. Tayal, Ronald J. W. Henry, and A. K. Pradhan*. **319**, 951, 105-C13 (1987)
- The Rotationally Modulated Zeeman Spectrum at Nearly 10^9 Gauss of the White Dwarf PG 1031 + 234. *William B. Latter, Gary D. Schmidt, and Richard F. Green*. **320**, 308, 111-D9 (1987)
- Collisional Charging of Interstellar Grains. *B. T. Draine and Brian Sutin*. **320**, 803, 118-E5 (1987)
- Predicted [Ni II] Infrared Line Strengths in the Crab Nebula and IC 443. *Richard B. C. Henry*. **322**, 399, 142-B12 (1987)
- Partial Redistribution in High-Density, Highly Ionized Plasmas. *B. Talin, R. Stamm, V. P. Kaftandjian, and Lewis Klein*. **322**, 804, 148-E12 (1987)
- Collision Rates for Excitation of Helium-like Ions with Inclusion of Resonance Effects. *Honglin Zhang and Douglas H. Sampson*. **63**, 487, 8-D5 (1987) (Abstr. in **312**, 967, 13-E8)
- Relativistic Free-free Gaunt Factor of the Dense High-Temperature Stellar Plasma. *Masayuki Nakagawa, Yasuharu Kohyama, and Naoki Itoh*. **63**, 661, 10-E14 (1987) (Abstr. in **313**, 930, 26-G13)
- High-Resolution Spectra of 24 Low-Redshift QSOs: The Properties of Mg II Absorption Systems. *David Tytler, A. Boksenberg, Wallace L. W. Sargent, Peter Young, and Daniel Kunth*. **64**, 667, 27-B8 (1987) (Abstr. in **318**, 945, 91-C10)
- ## Black Holes
- A 9.3 Hour Orbital Period in the Potential Black Hole Binary 4U 1957 + 11. *John R. Thorstensen*. **312**, 739, 11-A9 (1987)
- The Double Broad-Line Emitting Regions in NGC 5548 as Possible Evidence for a Supermassive Binary. *Bradley M. Peterson, Kirk T. Korista, and Stephen A. Cota*. **312**, L1, 7-A4 (1987)
- Dynamical Heating of Stars as a Fueling Mechanism for Active Galactic Nuclei. *A. J. Allen and P. A. Hughes*. **313**, 152, 16-F2 (1987)
- Nucleosynthesis inside Thick Accretion Disks around a Black Hole. I. Thermodynamic Conditions and Preliminary Analysis. *Sandip K. Chakrabarti, Liping Jin, and W. David Arnett*. **313**, 674, 24-B10 (1987)
- Thermal and Dynamical Effects of Pair Production on Two-Temperature Accretion Flows. *Mitchell C. Begelman, Marek Sikora, and Martin J. Rees*. **313**, 689, 24-C12 (1987)
- Self-collimated Electromagnetic Jets from Magnetized Accretion Disks.

Black Holes—Continued

- R. V. E. Lovelace, J. C. L. Wang, and M. E. Sulkanen. **315**, 504, 46-C1 (1987)
- Effects of Electron-Positron Pair Opacity for Spherical Accretion onto Black Holes. Alan P. Lightman, Andrzej A. Zdziarski, and Martin J. Rees. **315**, L113, 49-D8 (1987)
- Dark Clusters in Galactic Halos? B. J. Carr and C. G. Lacey. **316**, 23, 50-C6 (1987)
- The Evolution of Active Galactic Nuclei. II. Models with Stellar Evolution. Laurence P. David, Richard H. Durisen, and Haldan N. Cohn. **316**, 505, 57-E4 (1987)
- Use of a Minimum Rate of Change Formalism to Quantify Variability of Extragalactic X-Ray Sources. Daniel A. Schwartz. **318**, 568, 87-B7 (1987)
- How Big Are Supermassive Black Holes Formed from the Collapse of Dense Star Clusters? Christopher S. Kochanek, Stuart L. Shapiro, and Saul A. Teukolsky. **320**, 73, 108-G8 (1987)
- Electron Injection by Relativistic Protons in Active Galactic Nuclei. Marek Sikora, John G. Kirk, Mitchell C. Begelman, and Peter Schneider. **320**, L81, 121-B1 (1987)
- The Collapse of Dense Star Clusters to Supermassive Black Holes: Binaries and Gravitational Radiation. Gerald D. Quinlan and Stuart L. Shapiro. **321**, 199, 124-D2 (1987)
- Long-Term Gamma-Ray Spectral Variability of Cygnus X-1. J. C. Ling, W. A. Mahoney, Wm. A. Wheaton, and A. S. Jacobson. **321**, L117, 137-B8 (1987)
- X-Ray Irradiated Accretion Disks and Bimodal States. H. Inoue and R. Hoshi. **322**, 320, 141-C11 (1987)
- The High-Energy X-Ray Spectrum of Black Hole Candidate GX 339-4 during a Transition. J. F. Dolan, C. J. Crannell, B. R. Dennis, and L. E. Orwig. **322**, 324, 141-D1 (1987)
- Pair-Creation Effects in Accretion Shock Models of Active Galactic Nuclei. John M. Blondin and Arieh Königl. **323**, 451, 159-E1 (1987)
- Radiation-Hydrodynamic Calculation of Sub-Eddington Accretion Disks. G. E. Eggum, F. V. Coroniti, and J. I. Katz. **323**, 634, 161-F1 (1987)
- Origin and Acceleration of 10^{20} eV Cosmic-Ray Protons. Wilfred H. Sorrell. **323**, 647, 161-G1 (1987)

BL Lacertae Objects

- Simultaneous Multifrequency Observations of the BL Lacertae Object Markarian 421. F. Makino, Y. Tanaka, M. Matsuoka, K. Koyama, H. Inoue, K. Makishima, R. Hoshi, S. Hayakawa, Y. Kondo, C. M. Urry, S. L. Mufson, K. R. Hackney, L. R. Hackney, S. Kikuchi, Y. Mikami, W. Z. Wisniewski, N. Hiromoto, M. Nishida, J. Burnell, P. Brand, P. M. Williams, M. G. Smith, F. Takahara, M. Inoue, M. Tsuboi, H. Tabara, T. Kato, M. F. Aller, and L. D. Aller. **313**, 662, 24-A12 (1987)
- The Hiss of BL Lacertae. Richard L. Moore, Gary D. Schmidt, and Steven C. West. **314**, 176, 29-G10 (1987)
- Simultaneous Multifrequency Observations of Markarian 421. Jean Brodie, Stuart Bowyer, and Allyn Tennant. **318**, 175, 80-G5 (1987)
- Use of a Minimum Rate of Change Formalism to Quantify Variability of Extragalactic X-Ray Sources. Daniel A. Schwartz. **318**, 568, 87-B7 (1987)
- The Nature of the BL Lacertae Object AO 0235 + 164. Ross D. Cohen, Harding E. Smith, Vesa T. Junkkarinen, and E. Margaret Burbidge. **318**, 577, 87-C1 (1987)
- The Redshift of the BL Lacertae Object PKS 2005-489. R. Falomo, L. Maraschi, E. G. Tanzi, and A. Treves. **318**, L39, 92-B1 (1987)
- Imaging Redshift Estimates for Two BL Lacertae Objects. W. Romanishin. **320**, 586, 116-A14 (1987)
- X-Ray and Optical Observations of X-Ray-Selected BL Lacertae Objects. P. Giommi, P. Barr, B. Garilli, I. M. Gioia, T. Maccacaro, D. Maccagni, and R. E. Schild. **322**, 662, 146-A10 (1987)
- Quasar Energy Distributions. I. Soft X-Ray Spectra of Quasars. Belinda J. Wilkes and Martin Elvis. **323**, 243, 155-F5 (1987)
- Far-Infrared Variability in Active Galactic Nuclei. R. A. Edelson and M. A. Malkan. **323**, 516, 160-B14 (1987)
- Linear Polarization Structure of the BL Lacertae Object OJ 287 at Milliarcsecond Resolution. D. H. Roberts, D. C. Gabuzda, and J. F. C. Wardle. **323**, 536, 160-E5 (1987)
- A New Optical Catalog of Quasi-stellar Objects. A. Hewitt and G. Burbidge. **63**, 1, 1-A5 (1987) (Abstr. in **311**, 1076, 160-E12)
- Optical and Near-Infrared Observations of BL Lacertae Objects and Active Quasars. Paul S. Smith, Thomas J. Balonek, Richard Elston, and Paul A. Heckert. **64**, 459, 22-G9 (1987) (Abstr. in **316**, 860, 61-E2)
- Daily Observations of Compact Extragalactic Radio Sources at 2695 and 8085 MHz, 1979-1985. R. L. Fiedler, E. B. Waltman, J. H. Spencer, K. J. Johnston, P. E. Angerhofer, D. R. Florkowski, F. J.

Jasties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis. **65**, 319, 33-A5 (1987) (Abstr. in **321**, 1050, 136-A1)

Ca II Emission

- Chromospheric Ca II K-Line Variations in the Sun as a Star over a Solar Cycle. K. R. Sivaraman, Jagdev Singh, S. P. Bagare, and S. S. Gupta. **313**, 456, 20-A6 (1987)
- Objective Characterization of Stellar Activity Cycles. I. Methods and Solar Cycle Analyses. Ronald L. Gilliland and Sallie L. Baliunas. **314**, 766, 38-A6 (1987)
- Observation and Oscillatory Properties of Mesostructures in the Solar Chromosphere. L. Damé and M. Martic. **314**, L15, 33-C2 (1987)
- Chromospheric Activity and Ages of Solar-Type Stars. Don C. Barry, Richard H. Cromwell, and E. Keith Hege. **315**, 264, 42-G5 (1987)
- Discovery of Three New RS Canum Venaticorum-like Counterparts to HEAO 1 X-Ray Sources. D. A. H. Buckley, I. R. Tuohy, R. A. Remillard, H. V. Bradt, and D. A. Schwartz. **315**, 273, 42-G14 (1987)
- Einstein Observatory Survey of X-Ray Emission from Solar-Type Stars: The Late F and G Dwarf Stars. A. Maggio, S. Sciortino, G. S. Vaiana, P. Majer, J. Bookbinder, L. Golub, F. R. Harnden, Jr., and R. Rosner. **315**, 687, 48-B8 (1987)
- Stellar Activity in Synchronized Binaries. II. A Correlation Analysis with Single Stars. Gabor Basri. **316**, 377, 54-B9 (1987)
- Detection of a BY Draconis-like Binary Companion to the Contact Binary XY Leonis. Samuel C. Barden. **317**, 333, 67-E4 (1987)
- Duplicity among Stars with Strong Chromospheric Ca II Emission Lines: A Statistical Survey. Arthur Young, Richard A. Mielbrecht, and Helmut A. Abt. **317**, 787, 74-F1 (1987)
- The Activity, Variability, and Rotation of Lower Main-Sequence Hyades Stars. Richard R. Radick, D. T. Thompson, G. W. Lockwood, D. K. Duncan, and W. E. Baggett. **321**, 459, 127-B10 (1987)
- Clusters: Associations**
- Shock-Front Compression of the Magnetic Field in the Canis Major R1 Star Formation Region. F. J. Vrba, R. Baierlein, and W. Herbst. **317**, 207, 66-C4 (1987)
- A Study of Clumping in the Cepheus OB 3 Molecular Cloud. John S. Carr. **323**, 170, 155-A1 (1987)
- The Evolution of the Magnetic Fields of Ap Stars: Magnetic Observations of Stars in the Scorpion-Centaurus Association. Ian B. Thompson, Douglas N. Brown, and John D. Landstreet. **64**, 219, 19-B11 (1987) (Abstr. in **315**, 732, 48-E13)
- Stellar Multiplicity in the Scorpion-Centaurus Association. Hugo Levato, Stella Malaroda, Nidia Morrell, and Gladys Solivella. **64**, 487, 23-B8 (1987) (Abstr. in **315**, 731, 48-E12)
- The Kinematical and Binary Properties of Association and Field O Stars. D. R. Gies. **64**, 545, 24-G2 (1987) (Abstr. in **317**, 1003, 77-B6)
- Clusters: Globular**
- On the Interpretation of the Sandage Period-Shift Effect among Globular Cluster RR Lyrae Variables. Allen V. Sweigart, Alvio Renzini, and Amedeo Tornambè. **312**, 762, 11-C4 (1987)
- The Discovery of a Second Orbital Period from the X-Ray Source 4U 1820-30 in the Globular Cluster NGC 6624. L. Stella, W. Priedhorsky, and N. E. White. **312**, L17, 7-B4 (1987)
- The Formation of Ultra-Short Period Binaries in Globular Clusters. Frank Verbunt. **312**, L23, 7-B9 (1987)
- Intermediate-Age Core Helium Burning Stars and the Distance to the Magellanic Clouds. E. Seidel, G. S. Da Costa, and Pierre Demarque. **313**, 192, 17-B1 (1987)
- On Gravitational Oscillations. Jeremy Goodman. **313**, 576, 23-B1 (1987)
- EXOSAT Observations of Double-peaked Bursts with Radius Expansion from 4U/MXB 1820-30. F. Haberl, L. Stella, N. E. White, W. C. Priedhorsky, and M. Gotwald. **314**, 266, 31-A9 (1987)
- VLA Observations of the Fast Pulsar Candidate in M28. W. C. Erickson, M. J. Mahoney, R. H. Becker, and D. J. Helfand. **314**, L45, 39-B9 (1987)
- Main-Sequence CCD Photometry of the Globular Cluster NGC 362. Michael Bolte. **315**, 469, 45-G6 (1987)
- Globular Cluster Systems in the Supergiant Ellipticals of the Coma Cluster. William E. Harris. **315**, L29, 45-C6 (1987)
- High-Resolution Imaging from Mauna Kea: Globular Clusters in the Coma Cluster Galaxy NGC 4874. Laird A. Thompson and Francisco Valdes. **315**, L35, 45-C14 (1987)
- An 8.5 Hour X-Ray Period in the M15 X-Ray Source 4U 2129 + 12. Paul Hertz. **315**, L119, 49-D14 (1987)
- Blue Straggler Stars in the Globular Cluster NGC 5466. James M. Nemec and Hugh C. Harris. **316**, 172, 51-G7 (1987)
- Deep CCD Photometry in Globular Clusters. V. M5. Harvey B. Richer and Gregory G. Fahlman. **316**, 189, 52-A13 (1987)
- Chemical Enrichment of Halo Protoclusters with Differing Stellar Mass

- Functions. *Graeme H. Smith and Robert D. McClure*. **316**, 206, 52-C3 (1987)
- Evolution of *N*-Body Systems with Tidally Captured Binaries through the Core Collapse Phase. *Thomas S. Statler, Jeremiah P. Ostriker, and Haldan N. Cohn*. **316**, 626, 58-G9 (1987)
- On the Evolution of Tidal Capture X-Ray Binaries: 4U 2127 + 12 (M15) to 4U 1820 - 30 (NGC 6624). *Charles D. Bailyn and Jonathan E. Grindlay*. **316**, L25, 56-C3 (1987)
- On the Antonov Criterion for Gravitothermal Instability. *J. F. Luciani and R. Pellat*. **317**, 241, 66-E8 (1987)
- Axial Ratios and Orientations for 100 Galactic Globular Star Clusters. *Raymond E. White and Stephen J. Shawl*. **317**, 246, 66-E13 (1987)
- Discovery of Three Obscured Globular Clusters. *S. Djorgovski*. **317**, L13, 71-B2 (1987)
- Theoretical Stellar Luminosity Functions and the Ages and Compositions of Globular Clusters. *Stephen J. Ratcliff*. **318**, 196, 81-A13 (1987)
- The Distance to M5 from Its RR Lyrae Variables. *J. G. Cohen and G. A. Gordon*. **318**, 215, 81-C4 (1987)
- Simulations of Axisymmetric, Newtonian Star Clusters: Prelude to 2 + 1 General Relativistic Computations. *Stuart L. Shapiro and Saul A. Teukolsky*. **318**, 542, 86-G1 (1987)
- Massive Disk Formation from the Collision of a Main-Sequence Star with a White Dwarf in a Globular Cluster Core. *Noam Soker, Oded Regev, Mario Livio, and Michael M. Shara*. **318**, 760, 89-C4 (1987)
- The Binary Frequency of High-Velocity Field Dwarfs as Obtained with CCD Measures. *Helmuth A. Abt and Daryl W. Willmarth*. **318**, 786, 89-E1 (1987)
- BVI CCD Photometry of 47 Tucanae. *Gonzalo Alcaino and William Liller*. **319**, 304, 96-C9 (1987)
- Deep CCD Photometry of the Globular Cluster NGC 7099. *Michael Bolte*. **319**, 760, 103-D1 (1987)
- Evolution of Globular Clusters Including a Degenerate Component. *Hyung Mok Lee*. **319**, 772, 103-D13 (1987)
- Dynamical Effects of Successive Mergers on the Evolution of Spherical Stellar Systems. *Hyung Mok Lee*. **319**, 801, 103-F14 (1987)
- CCD Photometry of Globular Cluster Core Structure. I. NGC 6388, NGC 6624, and M15—One Flat Core and Two Cusps. *Phyllis M. Lugger, Haldan Cohn, Jonathan E. Grindlay, Charles D. Bailyn, and Paul Hertz*. **320**, 482, 114-F8 (1987)
- Evolution of Very Low Mass Stars and Brown Dwarfs. II. The Population II. *Francesca D'Antona*. **320**, 653, 117-A1 (1987)
- The Collapse of Dense Star Clusters to Supermassive Black Holes: Binaries and Gravitational Radiation. *Gerald D. Quinlan and Stuart L. Shapiro*. **321**, 199, 124-D2 (1987)
- The Age of the Large Magellanic Cloud Cluster NGC 2193. *G. S. Da Costa, Christopher R. King, and J. R. Mould*. **321**, 735, 132-E6 (1987)
- The Low-Luminosity X-Ray Sources in Omega Centauri. *Bruce Margon and Michael Bolte*. **321**, L61, 129-F11 (1987)
- Globular Cluster Evolution in the Galaxy: A Global View. *David F. Chernoff and Stuart L. Shapiro*. **322**, 113, 139-B9 (1987)
- The Evolution and Final Disintegration of Spherical Stellar Systems in a Steady Galactic Tidal Field. *Hyung Mok Lee and Jeremiah P. Ostriker*. **322**, 123, 139-C6 (1987)
- Fourier Coefficients of the RR Lyrae Variables in NGC 6171. *R. F. Stellingwerf and R. J. Dickens*. **322**, 133, 139-D2 (1987)
- The Evolutionary Status of 4U 1820 - 30. *S. Rappaport, L. A. Nelson, C. P. Ma, and P. C. Joss*. **322**, 842, 149-A12 (1987)
- Chemical Enrichment of Halo Protoclusters with Differing Stellar Mass Functions: Erratum. *Graeme H. Smith and Robert D. McClure*. **322**, 1074, 151-F12 (1987) (Orig. paper in **316**, 206, 52-C3)
- The M31 Globular Cluster System: Erratum. *D. Crampton, A. P. Cowley, D. Schade, and P. Chayer*. **322**, 1074, 151-F12 (1987) (Orig. paper in **288**, 494, 8-B2)
- A Preliminary Survey of Collapsed Cores in the Magellanic Clouds' Globular Clusters. *G. Meylan and S. Djorgovski*. **322**, L91, 152-C10 (1987)
- The Structure of Young Star Clusters in the Large Magellanic Cloud. *Rebecca A. W. Elson, S. Michael Fall, and Kenneth C. Freeman*. **323**, 54, 153-F1 (1987)
- Collapsed Cores and the Structural Parameters of Old Large Magellanic Cloud Star Clusters. *Mario Mateo*. **323**, L41, 158-C12 (1987)
- Spectroscopy of the $\lambda 7699$ K I line among Globular Cluster Giants. *Bruce Campbell and Graeme H. Smith*. **323**, L69, 158-E11 (1987)
- Theoretical Isochrones for Globular Clusters with Predicted Thuan-Gunn Photometry. *R. A. Bell and Don A. Vandenberg*. **323**, 335, 5-D10 (1987) (Abstr. in **312**, 966, 13-E7)
- Ultraviolet Observations by the IUE of 31 Clusters of the Large Magellanic Cloud. *A. Cassatella, J. Barbero, and E. H. Geyer*. **323**, 18-A7 (1987) (Abstr. in **314**, 832, 38-F8)
- RICHFLD Photometry of NGC 6723. *Donald H. Martins and Dorothy A. Fraquelli*. **323**, 83, 28-G2 (1987) (Abstr. in **319**, 1012, 106-A10)
- Evolutionary Sequences for Horizontal-Branch Stars. *Allen V. Sweigart*. **323**, 95, 29-A1 (1987) (Abstr. in **319**, 1012, 106-A10)
- Clusters: Open**
- Light Variability among the Late-Type B Pleiades Stars. *Bernard J. McNamara*. **312**, 778, 11-D7 (1987)
- Mass-losing Red Giants in Open Clusters. *M. Jura*. **313**, 743, 25-A1 (1987)
- IRAS Surface Brightness Maps of Reflection Nebulae in the Pleiades. *Michael W. Castellet, K. Sellgren, and M. W. Werner*. **313**, 853, 26-B1 (1987)
- The Ellipticities of Globular Clusters and the Cyanogen Problem. *John Norris*. **313**, L65, 27-C7 (1987)
- An Active Star Formation Site in RCW 108. *Steven Straw, A. R. Hyland, Terry J. Jones, Paul M. Harvey, Bruce A. Wilking, and Marshall Joy*. **314**, 283, 31-B12 (1987)
- The Discovery of Six New Short-Period Variables in the Old Open Cluster NGC 188. *Janusz Kaluzny and Michael M. Shara*. **314**, 585, 36-A2 (1987)
- Chromospheric Activity and Ages of Solar-Type Stars. *Don C. Barry, Richard H. Cromwell, and E. Keith Hege*. **315**, 264, 42-G5 (1987)
- Finsen 342 and the Hyades Distance Modulus. *Deane M. Peterson and Richard Solensky*. **315**, 286, 43-A13 (1987)
- Carbon-to-Nitrogen Ratios along the Evolutionary Sequence of M67. *Jeffery A. Brown*. **317**, 701, 73-F7 (1987)
- The Distribution of Rotational Velocities for Low-Mass Stars in the Pleiades. *John R. Stauffer and Lee W. Hartmann*. **318**, 337, 82-E5 (1987)
- Infrared Emission from Young Stars in the Nucleus of M82. *Marshall Joy, Daniel F. Lester, and Paul M. Harvey*. **319**, 314, 96-D5 (1987)
- RW Comae Berenices. III. Light Curve Solution and Absolute Parameters. *E. F. Milone, R. E. Wilson, and B. J. Hrivnak*. **319**, 325, 96-E3 (1987)
- The Pleiades Cluster. IV. The Visit of a Molecular CO Cloud. *Michel Breger*. **319**, 754, 103-C9 (1987)
- A Search for Brown Dwarfs and Late M Dwarfs in the Hyades and the Pleiades. *B. Zuckerman and E. E. Becklin*. **319**, L99, 107-F9 (1987)
- CCD Photometry of Large Magellanic Cloud Clusters. IV. The Metal-rich, Remote Southern Cluster LW 79. *Mario Mateo and Paul Hodge*. **320**, 626, 116-D14 (1987)
- Rotational Velocities of Low-Mass Stars in the Hyades. *John R. Stauffer, Lee W. Hartmann, and David W. Latham*. **320**, L51, 114-D12 (1987)
- The Activity, Variability, and Rotation of Lower Main-Sequence Hyades Stars. *Richard R. Radick, D. T. Thompson, G. W. Lockwood, D. K. Duncan, and W. E. Baggett*. **321**, 459, 127-B10 (1987)
- Lithium in the Coma Cluster. *Ann Merchant Boesgaard*. **321**, 967, 135-B3 (1987)
- Ultraviolet Interstellar Extinction toward NGC 6530 and the Intrinsic Energy Distribution of 9 Sagittarii and HD 165052. *Ana V. Torres*. **322**, 949, 150-C7 (1987)
- The Evolution of Red Clump Stars: Theoretical Sequences. *E. Seidel, P. Demarque, and D. Weinberg*. **323**, 917, 15-B13 (1987) (Abstr. in **314**, 832, 38-F8)
- Yellow Evolved Stars in Open Clusters. *James R. Sowell*. **323**, 241, 19-D5 (1987) (Abstr. in **315**, 732, 48-E13)
- Comets**
- On the Evolution and Activity of Cometary Nuclei. *Dina Prialnik and Akiva Bar-Nun*. **313**, 893, 26-E3 (1987)
- Comet Halley: OH Absorption of Galactic Background Radio Sources. *E. Bajaja, E. M. Arnal, J. C. Cerosimo, F. R. Colomb, M. C. Martin, J. Mazzaro, R. Morras, J. C. Olalde, W. G. L. Poppel, A. M. Silva, I. F. Mirabel, and V. Boriakoff*. **313**, 906, 26-F2 (1987)
- Fluorescence Efficiency Factors for Ionized Water Vapor. *Barry L. Lutz*. **315**, L147, 49-G2 (1987)
- The Bare Nucleus of Comet Neujmin 1. *Humberto Campins, Michael F. A'Hearn, and Lucy-Ann McFadden*. **316**, 847, 61-D1 (1987)
- Statistical Equilibrium in Cometary C₂. IV. A 10 Level Model Including Singlet-Triplet Transitions. *K. S. Krishna Swamy and C. R. O'Dell*. **317**, 543, 69-G7 (1987)
- Spectrophotometry of Comets Giacobini-Zinner and Halley. *Stephen C. Tegler and C. R. O'Dell*. **317**, 987, 77-A2 (1987)
- Surface Brightness Profiles of 10 Comets. *D. C. Jewitt and Karen J. Meech*. **317**, 992, 77-A7 (1987)
- Radiogenic Heating of Comets by ²⁶Al and Implications for Their Time of Formation. *Dina Prialnik, Akiva Bar-Nun, and Morris Podolak*. **319**, 993, 105-G1 (1987)
- Polyoxymethylene in Comet Halley. *W. F. Huebner, D. C. Boice, and C. M. Sharp*. **320**, L149, 121-F7 (1987)
- Ground-based Constraints on the H₂O⁺/CO⁺ Abundance Ratio and Dust Impact Rate in Comet P/Giacobini-Zinner: Comparison

Comets—Continued

with the ICE Spacecraft Results. *R. Mark Wagner, Barry L. Lutz, and S. Wyckoff.* **322**, 544, 143-G9 (1987)

Observation of the OH 1667 MHz Line toward Comet Halley from the Southern Hemisphere. *E. Bajaja, R. Morras, W. G. L. Pöppel, J. E. Cersosimo, M. C. Martin, J. Mazzaro, J. C. Olalde, A. Silva, E. M. Arnal, F. R. Colomb, I. F. Mirabel, and V. Boriakoff.* **322**, 549, 144-A1 (1987)

Convection

The Dynamical Oscillation and Propulsion of Magnetic Fields in the Convective Zone of a Star. I. General Considerations. *E. N. Parker.* **312**, 868, 12-D6 (1987)

A New Estimate of the Mixing Length and Convective Overshooting in Massive Stars. *Lawrence D. Cloutman.* **313**, 699, 24-D8 (1987)

Maxwellian-averaged Neutron Capture Cross Sections for ^{99}Tc and $^{95-98}\text{Mo}$. *R. R. Winters and R. L. Macklin.* **313**, 808, 25-E10 (1987)

The Influence of the Coriolis Force on Flux Tubes Rising through the Solar Convection Zone. *Arnab Rai Choudhuri and Peter A. Gilman.* **316**, 788, 60-F7 (1987)

Pulsations of White Dwarf Stars with Thick Hydrogen or Helium Surface Layers. *Arthur N. Cox, Sumner G. Starrfield, Russell B. Kidman, and W. Dean Pesnell.* **317**, 303, 67-B14 (1987)

On the Collapse of $8-10 M_{\odot}$ Stars Due to Electron Capture. *Shigeki Miyaji and Kenichi Nomoto.* **318**, 307, 82-C2 (1987)

The Dynamical Oscillation and Propulsion of Magnetic Fields in the Convective Zone of a Star. II. Thermal Shadows. *E. N. Parker.* **321**, 984, 135-C6 (1987)

Convection in Supernova Theory. *H. A. Bethe, G. E. Brown, and J. Cooperstein.* **322**, 201, 140-B3 (1987)

Wave Energy in White Dwarf Atmospheres. I. Magnetohydrodynamic Energy Spectra for Homogeneous DB and Layered DA Stars. *Zdzisław E. Musielak.* **322**, 234, 140-D8 (1987)

Cosmic Background Radiation

X-Ray Background, Discrete Sources, and Diffuse Processes. *Riccardo Giacconi and Giovanni Zamorani.* **313**, 20, 15-B12 (1987)

The Effect of Spherical Voids on the Microwave Background Radiation. *Keith L. Thompson and Ethan T. Vishniac.* **313**, 517, 22-D9 (1987)

A 1% Measurement of the Temperature of the Cosmic Microwave Radiation at $\lambda = 1.2$ Centimeters. *David G. Johnson and David T. Wilkinson.* **313**, L1, 21-A4 (1987)

Spectroscopy and Photometry of Elliptical Galaxies: A Large-Scale Streaming Motion in the Local Universe. *Alan Dressler, S. M. Faber, David Burstein, Roger L. Davies, Donald Lynden-Bell, R. J. Terlevich, and Gary Wegner.* **313**, L37, 27-A9 (1987)

Hot Spots in the Microwave Sky. *Nicola Vittorio and Roman Juszkiewicz.* **314**, L29, 39-A9 (1987)

Multipole Anisotropies of the Cosmic Background Radiation and Inflationary Models. *R. Fabbri, F. Lucchin, and S. Matarrese.* **315**, 1, 40-A7 (1987)

The Large-Scale Anisotropies of the Extragalactic Infrared Background. *R. Fabbri, P. Andreani, F. Melchiorri, and B. Nisini.* **315**, 12, 40-B4 (1987)

Cosmic Background Temperature Anisotropy in a Minimal Isocurvature Model for Galaxy Formation. *P. J. E. Peebles.* **315**, L73, 49-A11 (1987)

The Extragalactic Background Light and a Definitive Resolution of Olbers's Paradox. *Paul S. Wesson, K. Valle, and R. Stabell.* **317**, 601, 72-F5 (1987)

Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. *George F. Smoot, Marc Bensadoun, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Witebsky.* **317**, L45, 78-A9 (1987)

Inhomogeneous Cosmology. III. Primordial Gravitational Waves and Dust. *P. J. Adams, R. W. Hellings, and R. L. Zimmerman.* **318**, 1, 79-A5 (1987)

On the Validity of the Zel'dovich Approximation. *Benjamin Grinstein and Mark B. Wise.* **320**, 448, 114-C11 (1987)

Cosmic Fluctuation Spectra with Large-Scale Power. *J. M. Bardeen, J. R. Bond, and G. Efstathiou.* **321**, 28, 122-D1 (1987)

Small-scale Anisotropies in the Microwave Background in a Baryon-dominated Open Universe. *Naoteru Gouda, Misao Sasaki, and Yasushi Suto.* **321**, L1, 129-B4 (1987)

Reionization and Small-Scale Fluctuations in the Microwave Background. *Ethan T. Vishniac.* **322**, 597, 146-C13 (1987)

VLA Observations of H_2CO in Absorption against the Cosmic Background Radiation: Clumps in the S140 Molecular Cloud. *Neal J. Evans II, Marc L. Kutner, and Lee G. Mundy.* **323**, 145, 154-F3 (1987)

Minimal Cosmic Background Fluctuations Implied by Streaming Motions. *Roman Juszkiewicz, Krzysztof Górski, and Joseph Silk.* **323**, L1,

158-A4 (1987)

On the Origin of Possible Deviation from the Blackbody Spectrum of the Cosmic Microwave Background Radiation: Inverse Compton Hypothesis Based upon the Explosion Scenario. *Satoshi Yoshioka and Satoru Ikeuchi.* **323**, L7, 158-A10 (1987)

Distortion of the Cosmic Background Radiation by Superconducting Strings. *J. P. Ostriker and C. Thompson.* **323**, L97, 164-A9 (1987)

Cosmic Rays: Abundances

A Reexamination of the Cosmic-Ray Helium Spectrum and the $^3\text{He}/^4\text{He}$ Ratio at High Energies. *W. R. Webber, R. L. Golden, and R. A. Mewaldt.* **312**, 178, 2-G13 (1987)

Cosmic-Ray Positrons from 10 to 20 GeV: A Balloon-borne Measurement Using the Geomagnetic East-West Asymmetry. *Dietrich Müller and Kwok-kwong Tang.* **312**, 183, 3-A4 (1987)

Ariel 6 Measurements of the Fluxes of Ultraheavy Cosmic Rays. *P. H. Fowler, R. N. F. Walker, M. R. W. Masheder, R. T. Moses, A. Worley, and A. M. Gay.* **314**, 739, 37-F7 (1987)

Distributed Reacceleration of Cosmic Rays. *Amri Wandel, David Eichler, John R. Letaw, Rein Silberberg, and C. H. Tsao.* **316**, 676, 59-D13 (1987)

Can Distributed Acceleration Explain the Cosmic-Ray ^{15}N Abundance? *John R. Letaw.* **317**, L69, 78-C3 (1987)

Antiproton Production of Propagating Cosmic Rays under Distributed Reacceleration. *Manfred Simon, U. Heinbach, and Ch. Koch.* **320**, 699, 117-D6 (1987)

Cosmic-Ray Elemental Abundances from 1 to 10 GeV per AMU for Boron through Nickel. *Robert Dwyer and Peter Meyer.* **322**, 981, 150-E12 (1987)

Cosmic Ray Propagation in the Galaxy and in the Heliosphere: The Path-Length Distribution at Low Energy. *M. Garcia-Munoz, J. A. Simpson, T. G. Guzik, J. P. Wefel, and S. H. Margolis.* **64**, 269, 19-F6 (1987) (Abstr. in **315**, 733, 48-E14)

Cosmic Rays: General

Ultra-High Energy Cosmic Rays in a Galactic Wind and Its Termination Shock. *J. R. Jokipii and G. Morfill.* **312**, 170, 2-G5 (1987)

Smearing of a Beaming Pattern by an Isotropic Cloud: An Analysis with Applications to Nonpulsing X-Ray Sources and Cosmic Rays. *Y.-M. Wang and R. Schlickeiser.* **313**, 200, 17-B11 (1987)

Characteristics of Old Neutron Stars in Dense Interstellar Clouds. *H. Böhringer, G. E. Morfill, and H. U. Zimmermann.* **313**, 218, 17-D1 (1987)

Jovian Electrons at 1 AU: 1978–1984. *Dan Moses.* **313**, 471, 20-B8 (1987)

An Upper Limit on the Flux of Extraterrestrial Neutrinos. *R. Svoboda, R. M. Bionta, G. Blewitt, C. B. Bratton, D. Casper, P. Chrysocoulou, A. Cioico, R. Claus, B. Cortez, S. T. Dye, S. Errede, G. W. Foster, W. Gajewski, K. S. Ganezer, M. Goldhaber, T. J. Haines, T. W. Jones, D. Kielczewska, W. R. Kropp, J. G. Learned, J. M. LoSecco, J. Matthews, H. S. Park, R. Reines, J. Schultz, S. Seidel, E. Shumard, D. Sinclair, H. W. Sobel, J. L. Stone, L. Sulak, G. Thornton, J. C. van der Velde, and C. Wuest.* **315**, 420, 45-C10 (1987)

Distributed Reacceleration of Cosmic Rays. *Amri Wandel, David Eichler, John R. Letaw, Rein Silberberg, and C. H. Tsao.* **316**, 676, 59-D13 (1987)

Interplanetary Radial Cosmic-Ray Gradients and Their Implication for a Possible Large Modulation Effect at the Heliospheric Boundary. *W. R. Webber and J. A. Lockwood.* **317**, 534, 69-F11 (1987)

High-Energy Gamma Rays Probing Cosmic-Ray Spectral Differences throughout the Galaxy. *J. B. G. M. Bloemen.* **317**, L15, 71-B5 (1987)

Can Distributed Acceleration Explain the Cosmic-Ray ^{15}N Abundance? *John R. Letaw.* **317**, L69, 78-C3 (1987)

Solar Neutron Emissivity During the Large Flare on 1982 June 3. *E. L. Chupp, H. Debrunner, E. Flückiger, D. J. Forrest, F. Golliez, G. Kanbach, W. T. Vestrand, J. Cooper, and G. Share.* **318**, 913, 91-A1 (1987)

Hydrodynamical Constraints on Cosmic-Ray Acceleration in Relativistic Shocks. *G. M. Webb.* **319**, 215, 95-C12 (1987)

Elemental Technetium and Promethium as Cosmic-Ray Clocks. *J. Drach and M. H. Salamon.* **319**, 237, 95-E9 (1987)

A Simulation of High-Energy Cosmic-Ray Propagation. *M. Honda.* **319**, 836, 104-B7 (1987)

Cosmic-Ray-induced Photodestruction of Interstellar Molecules in Dense Clouds. *A. Sternberg, A. Dalgarno, and S. Lepp.* **320**, 676, 117-B11 (1987)

Energetic Particle Acceleration in Spherically Symmetric Accretion Flows and Shocks. *G. M. Webb and T. J. Bogdan.* **320**, 683, 117-C4 (1987)

Antiproton Production of Propagating Cosmic Rays under Distributed Reacceleration. *Manfred Simon, U. Heinbach, and Ch. Koch.* **320**, 699, 117-D6 (1987)

The Abundance of H_3^+ Ions in Dense Interstellar Clouds. *S. Lepp, A.*

- Dalgarno, and A. Sternberg.* 321, 383, 126-D4 (1987)
- Relativistic Transport Theory for Cosmic Rays: Erratum. *G. M. Webb.* 321, 606, 128-G2 (1987) (Orig. paper in 296, 319, 93-D7)
- On Stable Hydrostatic Equilibrium Configurations of the Galaxy and Implications for Its Halo. *J. B. G. M. Bloemen.* 322, 694, 147-D1 (1987)
- Origin and Acceleration of 10^{20} eV Cosmic-Ray Protons. *Wilfred H. Sorrell.* 323, 647, 161-G1 (1987)
- Cosmic-Ray-modified Stellar Winds. I. Solution Topologies and Singularities. *C. M. Ko and G. M. Webb.* 323, 657, 162-A1 (1987)
- Fermi Acceleration at Shocks with Arbitrary Velocity Profiles. *Peter Schneider and John G. Kirk.* 323, L87, 158-G1 (1987)
- Cosmology**
- The Formation and Evolution of Dwarf Galaxies and Lyman-Alpha Clouds: Two-Component Dark Matter. *Satoru Ikeuchi and Colin A. Norman.* 312, 485, 8-C1 (1987)
- Dynamical Friction and Evolution of the Luminosity Function in Clusters of Galaxies. *A. Kashlinsky.* 312, 497, 8-C13 (1987)
- Non-Newtonian Forces and the Invisible Mass Problem. *J. R. Kuhn and L. Kruglyak.* 313, 1, 15-A7 (1987)
- X-Ray Background, Discrete Sources, and Diffuse Processes. *Riccardo Giacconi and Giovanni Zamorani.* 313, 20, 15-B12 (1987)
- 1146 + 111B,C: A Giant Gravitational Lens? *R. D. Blandford, E. S. Phinney, and R. Narayan.* 313, 28, 15-C6 (1987)
- Fundamental Properties of Elliptical Galaxies. *S. Djorgovski and Marc Davis.* 313, 59, 15-E14 (1987)
- Kinematic Tests of Exotic Flat Cosmological Models. *Jane C. Charlton and Michael S. Turner.* 313, 495, 22-C1 (1987)
- Clusters, Filaments, and Voids in a Universe Dominated by Cold Dark Matter. *Simon D. M. White, Carlos S. Frenk, Marc Davis, and George Efstathiou.* 313, 505, 22-C11 (1987)
- The Effect of Spherical Voids on the Microwave Background Radiation. *Keith L. Thompson and Ethan T. Vishniac.* 313, 517, 22-D9 (1987)
- Light-Element Yields with Cosmological Decaying Gravitinos. *R. Dominguez-Tenreiro.* 313, 523, 22-E1 (1987)
- Resolution of the Discrepancy between the X-Ray Background Spectrum and That of Discrete Sources. *I. E. Segal.* 313, 543, 22-F7 (1987)
- Source Counts in the Chronometric Cosmology. *Edward L. Wright.* 313, 551, 22-G1 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies: A Large-Scale Streaming Motion in the Local Universe. *Alan Dressler, S. M. Faber, David Burstein, Roger L. Davies, Donald Lynden-Bell, R. J. Terlevich, and Gary Wegner.* 313, L37, 27-A9 (1987)
- A Gamma-Ray Constraint on the Nature of Dark Matter. *Joseph Silk and Hans Bloemen.* 313, L47, 27-B5 (1987)
- Note on "Symmetry Changes in Friedmann Cosmologies" by S. S. Bayin. *G. F. R. Ellis.* 314, 1, 28-A7 (1987)
- Interpretation of Large-Scale Deviations from the Hubble Flow. *B. Grinstein, H. David Politzer, S.-J. Rey, and Mark B. Wise.* 314, 431, 34-C1 (1987)
- Multipole Anisotropies of the Cosmic Background Radiation and Inflationary Models. *R. Fabbri, F. Lucchin, and S. Matarrese.* 315, 1, 40-A7 (1987)
- The Large-Scale Anisotropies of the Extragalactic Infrared Background. *R. Fabbri, P. Andreani, F. Melchiorri, and B. Nisini.* 315, 12, 40-B4 (1987)
- Dynamical Scenarios with Unstable Neutrinos. *T. Padmanabhan and M. V. Vasanthi.* 315, 411, 45-C1 (1987)
- New Limits to Bias and the Amount of Dark Matter in the Universe. *William C. Saslaw, H. M. Antia, and S. M. Chitre.* 315, L1, 45-A4 (1987)
- Cosmic Background Temperature Anisotropy in a Minimal Isocurvature Model for Galaxy Formation. *P. J. E. Peebles.* 315, L73, 49-A11 (1987)
- An Independent Method for Determining the Age of the Universe. *D. E. Winget, C. J. Hansen, James Liebert, H. M. Van Horn, G. Fontaine, R. E. Nather, S. O. Kepler, and D. Q. Lamb.* 315, L77, 49-B1 (1987)
- Gravitational Lenses and Decay of Dark Matter. *Avishai Dekel and Tsvi Piran.* 315, L83, 49-B6 (1987)
- Profiles of Clusters of Galaxies: Cosmological Scenarios versus Observations. *Michael J. West, Avishai Dekel, and Augustus Oemler, Jr.* 316, 1, 50-A8 (1987)
- Large-Scale Clustering of Galaxies with Massive Dark Halos. II. Mass-to-Light Profiles and Dynamical Mass Estimates of Galaxy Groups. *August E. Evrard.* 316, 36, 50-D6 (1987)
- Average Density in Cosmology. *W. B. Bonner.* 316, 49, 50-E7 (1987)
- The Thick Gravitational Lens: A Lens Composed of Many Elements at Different Distances. *Israel Kooner.* 316, 52, 50-E10 (1987)
- The Large-Scale Peculiar Velocity Field in Flat Models of the Universe. *Nicola Vittorio and Michael S. Turner.* 316, 475, 57-C1 (1987)
- Magnetohydrodynamic Cosmologies with a Bertotti-Robinson-like Limit. *R. Portugal and I. Damiao Soares.* 316, 483, 57-C9 (1987)
- Cosmological Accretion Wakes. *Edmund Bertschinger.* 316, 489, 57-D1 (1987)
- Nine Optically Selected Quasars with Redshifts Larger Than 3. *Maarten Schmidt, Donald P. Schneider, and James E. Gunn.* 316, L1, 56-A4 (1987)
- The Paucity of High-Redshift Quasars and Comparative Cosmology. *I. E. Segal.* 316, L5, 56-A8 (1987)
- Gamma-Ray Bursts from Superconducting Cosmic Strings at Large Redshifts. *Arif Babul, Bohdan Paczynski, and David Spergel.* 316, L49, 62-A9 (1987)
- The $Dn-\sigma$ Relation for Bulges of Disk Galaxies: A New, Independent Measure of the Hubble Constant. *Alan Dressler.* 317, 1, 64-A7 (1987)
- Gravitational Clustering and the Origin of the Correlation Function of Clusters of Galaxies. *A. Kashlinsky.* 317, 19, 64-B11 (1987)
- Dark Matter in the Universe: Massive Neutrinos Revisited. *R. Cowsik and P. Ghosh.* 317, 26, 64-C4 (1987)
- Inhomogeneous Cosmological Models: New Exact Solutions with Dust, Isotropic Radiation, and Electromagnetic Field. *Nazira Tomimura and Ioav Waga.* 317, 52, 64-E2 (1987)
- The Redshift-Distance Relation. IXa. Reinterpretation of the Local Group Deceleration Data Emphasizing the Kahn-Woltjer Mass Determination. *Allan Sandage.* 317, 557, 72-C1 (1987)
- Does Lower Ω Allow a Resolution of the Large-Scale Structure Problem? *Joseph Silk and Nicola Vittorio.* 317, 564, 72-C8 (1987)
- A Fluid Model for the Evolution of Large-Scale Structure. *P. J. E. Peebles.* 317, 576, 72-D8 (1987)
- The Local Extragalactic Velocity Field, the Local Mean Mass Density, and Biased Galaxy Formation. *M. E. Brown and P. J. E. Peebles.* 317, 588, 72-E6 (1987)
- Are the Virial Masses of Clusters Smaller Than We Think? *L. L. Cowie, M. Henriksen, and R. Mushotzky.* 317, 593, 72-E11 (1987)
- The Extragalactic Background Light and a Definitive Resolution of Olbers's Paradox. *Paul S. Wesson, K. Valle, and R. Stabell.* 317, 601, 72-F5 (1987)
- Antimatter and Light Element Yields: Could Dark Matter be Baryonic? *R. Dominguez-Tenreiro and G. Yepes.* 317, L1, 71-A4 (1987)
- Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. *George F. Smoot, Marc Bershadoun, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Wittebsky.* 317, L45, 78-A9 (1987)
- Gravitational Microlensing and Gamma-Ray Bursts. *Bohdan Paczynski.* 317, L51, 78-B1 (1987)
- Inhomogeneous Cosmology. III. Primordial Gravitational Waves and Dust. *P. J. Adams, R. W. Hellings, and R. L. Zimmerman.* 318, 1, 79-A5 (1987)
- Galaxy Formation by Gravitational Collapse. *Barbara S. Ryden and James E. Gunn.* 318, 15, 79-B5 (1987)
- Observations and Nonstandard FRW Models. *A. A. Coley.* 318, 487, 86-C1 (1987)
- Observations of Novae in the Virgo Cluster. *Christopher J. Pritchett and Sidney van den Bergh.* 318, 507, 86-D7 (1987)
- Extraction of Cosmological Information from Multimode Gravitational Lenses. *Israel Kooner.* 318, L1, 85-A4 (1987)
- Normalization, Cold Dark Matter, and Large-Scale Velocities. *Yehuda Hoffman.* 318, L7, 85-A9 (1987)
- Interpretation of Deep Counts of Radio Sources. *L. Danese, G. De Zotti, A. Franceschini, and L. Toffolatti.* 318, L15, 85-B2 (1987)
- The Formation of Families of Twin Galaxies by String Loops. *Lennox L. Cowie and Esther M. Hu.* 318, L33, 92-A9 (1987)
- The Use of the Brightest Blue Supergiants as Distance Indicators—Further Complications; OR The Brightest "Stars" Are Not Always Stars. *Robert M. Humphreys and Marc Aaronson.* 318, L69, 92-C14 (1987)
- A Quantitative Approach to the Topology of Large-Scale Structure. *J. Richard Gott III, David H. Weinberg, and Adrian L. Melott.* 319, 1, 93-A7 (1987)
- An Analytically Soluble Problem in Fully Nonlinear Statistical Gravitational Lensing. *P. Schneider.* 319, 9, 93-B1 (1987)
- Were the Lyman- α Clouds Formed from Shocks? *Ethan T. Vishniac and Gary S. Busi.* 319, 14, 93-B7 (1987)
- Surveys of Fields around Quasars. IV. Luminosity of Galaxies at $z \geq 0.6$ and Preliminary Evidence for the Evolution of the Environment of Radio-loud Quasars. *H. K. C. Yee and Richard F. Green.* 319, 28, 93-C12 (1987)
- Bimodal Star Formation: Constraints from Galaxy Colors at High Redshift. *Rosemary F. G. Wyse and Joseph Silk.* 319, L1, 100-A4 (1987)

Cosmology—Continued

- Large-Scale Structure from Cosmic String Loops. I. Formation and Linear Evolution of Perturbations. *Robert J. Scherrer*. **320**, 1, 108-A7 (1987)
- Void Probabilities in the Galaxy Distribution: Scaling and Luminosity Segregation. *Sophie Maurogordato and Marc Lachièze-Rey*. **320**, 13, 108-B5 (1987)
- Correction of a Study of Source Counts in the Chronometric Cosmology. *I. E. Segal*. **320**, 135, 109-E1 (1987)
- The Quark-Hadron Phase Transition and Primordial Nucleosynthesis. *C. A. Alcock, G. M. Fuller, and G. J. Mathews*. **320**, 439, 114-C1 (1987)
- Blackbody Emissivity of Supernova 1987A and the Extragalactic Distance Scale. *David Branch*. **320**, L23, 114-C1 (1987)
- $z_{\text{abs}} \sim z_{\text{em}}$ Absorption Systems in Quasar Spectra: A Correlation with Radio and Optical Luminosity? *Palle Möller and Peter Jakobsen*. **320**, L75, 121-A9 (1987)
- The Topology of Large-Scale Structure. Topology and the Random Phase Hypothesis. *David H. Weinberg, J. Richard Gott III, and Adrian L. Melott*. **321**, 2, 122-A8 (1987)
- Cosmic Fluctuation Spectra with Large-Scale Power. *J. M. Bardeen, J. R. Bond, and G. Efstathiou*. **321**, 28, 122-D1 (1987)
- Correlation Function in Decaying Particle Cosmology. *Yasushi Suto*. **321**, 36, 122-D12 (1987)
- The Distribution of QSO Absorption System Column Densities: Evidence for a Single Population. *David Tytler*. **321**, 49, 122-F6 (1987)
- The Redshift Distribution of QSO Lyman-Alpha Absorption Systems. *David Tytler*. **321**, 69, 122-G12 (1987)
- 6 Centimeter Radio Source Counts and Spectral Index Studies Down to 0.1 Millijanskys. *R. Hank Donnelly, R. Bruce Partridge, and Rogier A. Windhorst*. **321**, 94, 123-B9 (1987)
- The Morphology of the Rich Supercluster 1451 + 22. *Robin Ciardullo*. **321**, 607, 131-C1 (1987)
- Small-scale Anisotropies in the Microwave Background in a Baryon-dominated Open Universe. *Naoteru Gouda, Misao Sasaki, and Yasushi Suto*. **321**, L1, 129-B4 (1987)
- PC 0910 + 5625: An Optically Selected Quasar with a Redshift of 4.04. *Maarten Schmidt, Donald P. Schneider, and James E. Gunn*. **321**, L7, 129-B10 (1987)
- A Correlation between the Radio and Optical Morphologies of Distant 3CR Radio Galaxies. *Patrick J. McCarthy, Wil van Breugel, Hyron Spinrad, and S. Djorgovski*. **321**, L29, 129-D3 (1987)
- Cosmological H II Regions and the Photoionization of the Intergalactic Medium. *Paul R. Shapiro and Mark L. Giorux*. **321**, L107, 137-A13 (1987)
- Cosmic String Waves. *Albert Stebbins, Shoba Veeraraghavan, Robert Brandenberger, Joseph Silk, and Neil Turok*. **322**, 1, 138-A7 (1987)
- The Origin of the Diffuse X-Ray Background and the Formation of Galaxies and Voids. *Ruth A. Daly*. **322**, 20, 138-B12 (1987)
- The Self-similar Cosmological Paradigm: A New Test and Two New Predictions. *Robert L. Oldershaw*. **322**, 34, 138-C12 (1987)
- Cosmological Parameters from the IRAS Galaxy Sample. *Jens Verner Villumsen and Michael A. Strauss*. **322**, 37, 138-D1 (1987)
- The Appearance of Primeval Galaxies. *E. Baron and Simon D. M. White*. **322**, 585, 146-C1 (1987)
- Reionization and Small-Scale Fluctuations in the Microwave Background. *Ethan T. Vishniac*. **322**, 597, 146-C13 (1987)
- An Absorption-Line Survey of 32 QSOs at Red Wavelengths: Properties of the Mg II Absorbers. *Kenneth M. Lanzetta, David A. Turnshek, and Arthur M. Wolfe*. **322**, 739, 148-A2 (1987)
- Constraints on Possible Precursor AGN Sources of the Cosmic X-Ray Background. *Elihu Boldt and Darryl Leiter*. **322**, L1, 145-A4 (1987)
- A Search for QSOs to Fit a Cosmological Model with Flat, Closed Spatial Sections. *H. V. Fagundes and U. F. Wichoski*. **322**, L5, 145-A8 (1987)
- More About Clustering on a Scale of 0.1 c. *R. Brent Tully*. **323**, 1, 153-A7 (1987)
- Measurements of the ^3He Abundance in the Interstellar Medium. *T. M. Bania, Robert T. Rood, and T. L. Wilson*. **323**, 30, 153-D3 (1987)
- Double Inflation: A Possible Resolution of the Large-Scale Structure Problem. *Michael S. Turner, Jens V. Villumsen, Nicola Vittorio, Joseph Silk, and Roman Juszkiewicz*. **323**, 423, 159-C1 (1987)
- Minimal Cosmic Background Fluctuations Implied by Streaming Motions. *Roman Juszkiewicz, Krzysztof Górski, and Joseph Silk*. **323**, L1, 158-A4 (1987)
- On the Origin of Possible Deviation from the Blackbody Spectrum of the Cosmic Microwave Background Radiation: Inverse Compton Hypothesis Based upon the Explosion Scenario. *Satoshi Yoshioka and Satoru Ikeuchi*. **323**, L7, 158-A10 (1987)
- Distortion of the Cosmic Background Radiation by Superconducting Strings. *J. P. Ostriker and C. Thompson*. **323**, L97, 164-A9 (1987)
- Path Integral Methods for Primordial Density Perturbations: Sampling of Constrained Gaussian Random Fields. *Edmund Bertschinger*. **323**, L103, 164-A14 (1987)
- Primeval Galaxies and Cold Dark Matter. *Joseph Silk and Alexander Szalay*. **323**, L107, 164-B4 (1987)
- Extraction of Cosmological Information from Multiimage Gravitational Lenses: Erratum. *Israel Kover*. **323**, L155, 164-E13 (1987) (Orig. paper in **318**, L1, 85-A4)
- High-Resolution Spectra of 24 Low-Redshift QSOs: The Properties of Mg II Absorption Systems. *David Tytler, A. Boksenberg, Wallace L. W. Sargent, Peter Young, and Daniel Kunth*. **64**, 667, 27-B8 (1987) (Abstr. in **318**, 945, 91-C10)

Dense Matter

- Nonadiabatic Gravitational Collapse. *A. K. G. de Oliveira and N. O. Santos*. **312**, 640, 10-A1 (1987)
- Neutrino Emission by the Pair, Plasma, and Photo Processes in the Weinberg-Salam Model. *Paul J. Schinder, David N. Schramm, Paul J. Witla, Steven H. Margolis, and David L. Tubbs*. **313**, 531, 22-E9 (1987)
- Neutrino-Pair Bremsstrahlung in Dense Stars. V. Partially Degenerate Electrons. *Hiroharu Munakata, Yasuharu Kohyama, and Naoki Itoh*. **316**, 708, 59-G3 (1987)
- The Role of the Viscous Secular Instability in Rotating Neutron Stars. *Lee Lindblom*. **317**, 325, 67-D9 (1987)
- Viscosity of Dense Matter. *Naoki Itoh, Yasuharu Kohyama, and Hideo Tekeuchi*. **317**, 733, 74-A13 (1987)
- The Effects of Neutrino Transport on the Collapse of Iron Stellar Cores. *E. S. Myra, S. A. Bludman, Y. Hoffman, I. Lichenstadt, N. Sack, and K. A. Van Riper*. **318**, 744, 89-B2 (1987)
- Axion Bremsstrahlung in Dense Stars. *Masayuki Nakagawa, Yasuharu Kohyama, and Naoki Itoh*. **322**, 291, 141-A9 (1987)
- Neutrino-Pair Bremsstrahlung in Dense Stars. IV. Phonon Contributions in the Crystalline Lattice Phase: Erratum. *Naoki Itoh, Yasuharu Kohyama, Noriyoshi Matsumoto, and Midori Seki*. **322**, 584, 144-C9 (1987) (Orig. paper in **285**, 304, 113-C2)

Deuterium

- A New Assault on the 92 Centimeter Line of D I. *Leo Blitz and Carl Heiles*. **313**, L95, 27-E9 (1987)
- Antimatter and Light Element Yields: Could Dark Matter be Baryonic? *R. Dominguez-Tenreiro and G. Yepes*. **317**, L1, 71-A4 (1987)
- Aperture Synthesis Maps of HD0 Emission in Orion-KL. *R. L. Plambeck and M. C. H. Wright*. **317**, L101, 78-E4 (1987)

Diffusion

- Rate of Energy Gain and Maximum Energy in Diffusive Shock Acceleration. *J. R. Jokipii*. **313**, 842, 26-A2 (1987)
- Diffusive Shock Acceleration: Comparison of a Unified Shock Model to Bow Shock Observations. *Donald C. Ellison and Eberhard Möbius*. **318**, 474, 84-B6 (1987)
- Lithium in the Coma Cluster. *Ann Merchant Boesgaard*. **321**, 967, 135-B3 (1987)
- Particle Acceleration at Shocks: A Monte Carlo Method. *J. G. Kirk and P. Schneider*. **322**, 256, 140-F2 (1987)
- Selective Mass Loss, Abundance Anomalies, and Helium-rich Stars. *G. Michaud, J. Dupuis, G. Fontaine, and T. Montmerle*. **322**, 302, 141-B7 (1987)

Early Universe

- The Formation and Evolution of Dwarf Galaxies and Lyman-Alpha Clouds: Two-Component Dark Matter. *Satoru Ikeuchi and Colin A. Norman*. **312**, 485, 8-C1 (1987)
- Clusters, Filaments, and Voids in a Universe Dominated by Cold Dark Matter. *Simon D. M. White, Carlos S. Frenk, Marc Davis, and George Efstathiou*. **313**, 505, 22-C11 (1987)
- Light-Element Yields with Cosmological Decaying Gravitinos. *R. Dominguez-Tenreiro*. **313**, 523, 22-E1 (1987)
- Multipole Anisotropies of the Cosmic Background Radiation and Inflationary Models. *R. Fabbri, F. Lucchin, and S. Matarrese*. **315**, 1, 40-A7 (1987)
- The Large-Scale Peculiar Velocity Field in Flat Models of the Universe. *Nicola Vittorio and Michael S. Turner*. **316**, 475, 57-C1 (1987)
- Long-Wavelength Measurements of the Cosmic Microwave Background Radiation Spectrum. *George F. Smoot, Marc Bershadoun, Marco Bersanelli, Giovanni De Amici, Alan Kogut, Steve Levin, and Chris Witebsky*. **317**, L45, 78-A9 (1987)
- Galaxy Formation by Gravitational Collapse. *Barbara S. Ryden and James E. Gunn*. **318**, 15, 79-B5 (1987)
- Large-Scale Structure from Cosmic String Loops. I. Formation and Linear Evolution of Perturbations. *Robert J. Scherrer*. **320**, 1, 108-A7 (1987)

- On the Validity of the Zel'dovich Approximation. *Benjamin Grinstein and Mark B. Wise*. **320**, 448, 114-C11 (1987)
- Small-scale Anisotropies in the Microwave Background in a Baryon-dominated Open Universe. *Naoteru Gouda, Misao Sasaki, and Yasushi Suto*. **321**, L1, 129-B4 (1987)
- Cosmic String Waves. *Albert Stebbins, Shoba Veeraraghavan, Robert Brandenberger, Joseph Silk, and Neil Turok*. **322**, 1, 158-A7 (1987)
- Earth: General**
- Diffusive Shock Acceleration: Comparison of a Unified Shock Model to Bow Shock Observations. *Donald C. Ellison and Eberhard Möbius*. **318**, 474, 84-B6 (1987)
- Elementary Particles**
- Cosmic-Ray Positrons from 10 to 20 GeV: A Balloon-borne Measurement Using the Geomagnetic East-West Asymmetry. *Dietrich Müller and Kwok-kwong Tang*. **312**, 183, 3-A4 (1987)
- The Formation and Evolution of Dwarf Galaxies and Lyman-Alpha Clouds: Two-Component Dark Matter. *Satoru Ikeuchi and Colin A. Norman*. **312**, 485, 8-C1 (1987)
- Light-Element Yields with Cosmological Decaying Gravitinos. *R. Dominguez-Tenreiro*. **313**, 523, 22-E1 (1987)
- Neutrino Emission by the Pair, Plasma, and Photo Processes in the Weinberg-Salam Model. *Paul J. Schinder, David N. Schramm, Paul J. Wiita, Steven H. Margolis, and David L. Tubbs*. **313**, 531, 22-E9 (1987)
- Electromagnetic Cascades in the Magnetosphere of a Very Young Pulsar: A Model for the Positron Production near the Galactic Center. *Apostolos Mastichiadis, Kenneth Brecher, and Alan P. Marscher*. **314**, 88, 29-A5 (1987)
- Dynamical Scenarios with Unstable Neutrinos. *T. Padmanabhan and M. M. Vasanthi*. **315**, 411, 45-C1 (1987)
- Neutrino Flows in Collapsing Stars: A Two-Fluid Model: Erratum. *J. Cooperstein, L. J. van den Horn, and E. A. Baron*. **315**, 729, 48-E10 (1987) (Orig. paper in **309**, 653, 128-D5)
- Very High Energy Gamma-Ray Spectroscopy. *David Eichler and James H. Adams, Jr.* **317**, 551, 70-A1 (1987)
- Galactic Center Positronium Fraction: Observations and Simulations. *B. L. Brown and M. Leventhal*. **319**, 637, 102-A1 (1987)
- The Quark-Hadron Phase Transition and Primordial Nucleosynthesis. *C. A. Alcock, G. M. Fuller, and G. J. Mathews*. **320**, 439, 114-C1 (1987)
- Correlation Function in Decaying Particle Cosmology. *Yasushi Suto*. **321**, 36, 122-D2 (1987)
- Relativistic Thermal Plasmas: Time Development of Electron-Positron Pair Concentration. *Masaaki Kusunose*. **321**, 186, 124-C3 (1987)
- Weakly Interacting Massive Particle Distribution in and Evaporation from the Sun. *Andrew Gould*. **321**, 560, 128-C3 (1987)
- Resonant Enhancements in Weakly Interacting Massive Particle Capture by the Earth. *Andrew Gould*. **321**, 571, 128-D1 (1987)
- The Self-similar Cosmological Paradigm: A New Test and Two New Predictions. *Robert L. Oldershaw*. **322**, 34, 138-C12 (1987)
- Resonant Neutrino Oscillations and Stellar Collapse. *G. M. Fuller, R. W. Mayle, J. R. Wilson, and D. N. Schramm*. **322**, 795, 148-E3 (1987)
- Positron Annihilation Gamma Rays from Novae. *Mark D. Leising and Donald D. Clayton*. **323**, 159, 154-G4 (1987)
- Pair-Creation Effects in Accretion Shock Models of Active Galactic Nuclei. *John M. Blondin and Ariele Königl*. **323**, 451, 159-E1 (1987)
- Equation of State**
- The Effect of Viscosity on Neutron Star Oscillations. *Curt Cutler and Lee Lindblom*. **314**, 234, 30-F4 (1987)
- Errata and Addenda**
- Observations of Soft X-Ray Spectra from a Seyfert 1 and a Narrow Emission-Line Galaxy: Erratum. *K. P. Singh, G. P. Garmire, and J. Nousek*. **312**, 484, 6-B10 (1987) (Orig. paper in **297**, 633, 108-D10)
- The Dust Shells of NML Cygnus and IRC 10420: Inner Radius, Temperature, and Optical Thickness: Erratum. *Stephen T. Ridgway, Richard R. Joyce, Dennis Connors, Judith L. Pipher, and Christopher Dainty*. **312**, 963, 13-E1 (1987) (Orig. paper in **302**, 662, 37-G8)
- A Physical Model for the 2175 Å Interstellar Extinction Feature: Erratum. *J. H. Hecht*. **314**, 429, 32-G9 (1987) (Orig. paper in **305**, 817, 77-G6)
- An IRAS Survey of IR Excesses in G-Type Stars. *Sten F. Odenwald*. **314**, 830, 38-F2 (1987) (Orig. paper in **307**, 711, 104-F6)
- Electron Impact Excitation of H₂: Rydberg Band Systems and the Benchmark Dissociative Cross Section of H Lyman-Alpha. *D. E. Shemansky, J. M. Ajello, and D. T. Hall*. **315**, 408, 44-C14 (1987) (Orig. paper in **296**, 765, 98-D6)
- Deconvolution of Elliptical Nuclei of Galaxies: Application to M81: Erratum. *O. Bendenelli, G. Parmeggiani, and T. Zavatti*. **315**, 408, 44-C14 (1987) (Orig. paper in **308**, 611, 115-E14)
- Neutrino Flows in Collapsing Stars: A Two-Fluid Model: Erratum. *J. Cooperstein, L. J. van den Horn, and E. A. Baron*. **315**, 729, 48-E10 (1987) (Orig. paper in **309**, 653, 128-D5)
- Evolution and Infrared Spectra of Brown Dwarfs: Erratum. *Jonathan I. Lunine, William B. Hubbard, and Mark S. Marley*. **316**, 473, 55-B13 (1987) (Orig. paper in **310**, 238, 134-F2)
- 92 Centimeter VLBI Structure of the Elliptical Galaxy MCG 5-4-18: Erratum. *J. M. Wrobel and R. S. Simon*. **316**, 858, 61-D14 (1987) (Orig. paper in **309**, 593, 127-F6)
- A Radio Survey of Symbiotic Stars: Erratum. *E. R. Seaquist, A. R. Taylor, and S. Sutton*. **317**, 555, 70-A5 (1987) (Orig. paper in **284**, 202, 100-C7)
- Optical Properties of Interstellar Graphite and Silicate Grains: Erratum. *B. T. Draine and Hyung Mok Lee*. **318**, 485, 84-C4 (1987) (Orig. paper in **285**, 89, 111-A3)
- Observations of a Solar Latitude-dependent Limb Brightness Variation: Erratum. *J. R. Kuhn, K. G. Libbrecht, and R. H. Dicke*. **319**, 1010, 106-A8 (1987) (Orig. paper in **290**, 758, 32-C8)
- Volume Contents Page for Volume 313: Erratum. *Staff*. **319**, L115, 107-G11 (1987)
- Collision-induced Rototranslational Absorption Spectra of N₂-N₂ Pairs for Temperatures from 50 to 300 K: Erratum. *Aleksandra Borysov and Lothar Frommhold*. **320**, 437, 112-G4 (1987) (Orig. paper in **311**, 1043, 160-C6)
- The Abundance of Gallium in B-Type Chemically Peculiar Stars: Addendum. *Masahide Takada-Hidai, Kozo Sadakane, and Jun Jugaku*. **320**, 437, 112-G4 (1987) (Orig. paper in **304**, 425, 58-D14)
- IRAS 18059 - 3211: Optically Known As Gomez's Hamburger: Erratum. *M. T. Ruiz, V. Blanco, J. Maza, S. Heathcote, A. Phillips, K. Kawara, C. Anguita, M. Hamuy, and A. Gomez*. **320**, L157, 121-F14 (1987) (Orig. paper in **316**, L21, 56-B10)
- Relativistic Transport Theory for Cosmic Rays: Erratum. *G. M. Webb*. **321**, 606, 128-G2 (1987) (Orig. paper in **296**, 319, 93-D7)
- Ion-Dipolar Molecule Rate Coefficients: Erratum. *Wm. Lowell Morgan and David R. Bates*. **321**, 1049, 136-A1 (1987) (Orig. paper in **314**, 817, 38-E3)
- Planetary Fast Neutral Emission and Effects on the Solar Wind: A Cometary Exosphere Analog: Erratum. *D. D. Barbosa and A. Evitar*. **321**, 1049, 136-A1 (1987) (Orig. paper in **310**, 927, 144-B10)
- Neutrino-Pair Bremsstrahlung in Dense Stars. IV. Phonon Contributions in the Crystalline Lattice Phase: Erratum. *Naoki Itoh, Yasuharu Kohyama, Noriyoshi Matsumoto, and Midori Seki*. **322**, 584, 144-C9 (1987) (Orig. paper in **285**, 304, 113-C2)
- Chemical Enrichment of Halo Protoclusters with Differing Stellar Mass Functions: Erratum. *Graeme H. Smith and Robert D. McClure*. **322**, 1074, 151-F12 (1987) (Orig. paper in **316**, 206, 52-C3)
- The M31 Globular Cluster System: Erratum. *D. Crampton, A. P. Cowley, D. Schade, and P. Chayer*. **322**, 1074, 151-F12 (1987) (Orig. paper in **288**, 494, 8-B2)
- Extraction of Cosmological Information from Multiimage Gravitational Lenses: Erratum. *Israel Kowner*. **323**, L155, 164-E13 (1987) (Orig. paper in **318**, L1, 85-A4)
- Tabulated Optical Properties of Graphite and Silicate Grains: Erratum. *B. T. Draine*. **64**, 505, 23-C11 (1987) (Abstr. in **289**, 861, 21-F4)
- Galaxies: Abundances**
- Magnesium Gradients in Elliptical Galaxies. II. NGC 4881. *Bjarne Thomsen and William A. Baum*. **315**, 460, 45-F10 (1987)
- Spartan 1 X-Ray Observations of the Perseus Cluster: Comparison of the Iron Abundances and Temperatures in the Inner and Outer Regions of the Cluster. *M. P. Ulmer, R. G. Cruddace, E. E. Fenimore, G. G. Fritz, and W. A. Snyder*. **319**, 118, 94-C11 (1987)
- Far-Infrared Measurements of N/O in H II Regions: Evidence for Enhanced CN Process Nucleosynthesis in the Inner Galaxy. *D. F. Lester, H. L. Dinerstein, M. W. Werner, D. M. Watson, R. Genzel, and J. W. V. Storey*. **320**, 573, 116-A1 (1987)
- On the Origin of Dwarf Galaxies. *Joseph Silk, Rosemary F. G. Wyse, and G. A. Shields*. **322**, L59, 152-A9 (1987)
- Galaxies: Clustering**
- The Formation and Evolution of Dwarf Galaxies and Lyman-Alpha Clouds: Two-Component Dark Matter. *Satoru Ikeuchi and Colin A. Norman*. **312**, 485, 8-C1 (1987)
- Dynamical Friction and Evolution of the Luminosity Function in Clusters of Galaxies. *A. Kashlinsky*. **312**, 497, 8-C13 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies. I. New Distance Estimator. *Alan Dressler, Donald Lynden-Bell, David Burstein, Roger L. Davies, S. M. Faber, Roberto Terlevich, and Gary Wegner*. **313**, 42, 15-D7 (1987)
- Tidal Stripping and Accretion in Clusters of Galaxies with Smoothly Distributed Missing Mass. *Juan C. Muzzio, Victor H. Dossanuet, and M. Marcela Vergne*. **313**, 112, 16-C4 (1987)
- The Distribution of Dark Matter in the Coma Cluster. *David Merritt*.

Galaxies: Clustering—Continued

- 313, 121, 16-C13 (1987)
- Clusters, Filaments, and Voids in a Universe Dominated by Cold Dark Matter. *Simon D. M. White, Carlos S. Frenk, Marc Davis, and George Efstathiou.* 313, 505, 22-C11 (1987)
- Arm Classifications for Spiral Galaxies. *Debra Meloy Elmegreen and Bruce G. Elmegreen.* 314, 3, 28-A10 (1987)
- A Survey of the Bootes Void. *Robert P. Kirshner, Augustus Oemler, Jr., Paul L. Schechter, and Stephen A. Shectman.* 314, 493, 35-A2 (1987)
- Emission-Line Galaxies in the Bootes Void. *J. Ward Moody, Robert P. Kirshner, Gordon M. MacAlpine, and Stephen A. Gregory.* 314, L33, 39-A13 (1987)
- New Limits to Bias and the Amount of Dark Matter in the Universe. *William C. Saslaw, H. M. Antia, and S. M. Chitre.* 315, L1, 45-A4 (1987)
- Gravitational Lenses and Decay of Dark Matter. *Avishai Dekel and Tsvi Piran.* 315, L83, 49-B6 (1987)
- The Spatial Distribution of Dwarf Galaxies in the CfA Slice of the Universe. *Trinh X. Thuan, J. Richard Gott III, and Stephen E. Schneider.* 315, L93, 49-C2 (1987)
- Profiles of Clusters of Galaxies: Cosmological Scenarios versus Observations. *Michael J. West, Avishai Dekel, and Augustus Oemler, Jr.* 316, 1, 50-A8 (1987)
- Large-Scale Clustering of Galaxies with Massive Dark Halos. II. Mass-to-Light Profiles and Dynamical Mass Estimates of Galaxy Groups. *August E. Evrard.* 316, 36, 50-D6 (1987)
- Average Density in Cosmology. *W. B. Bonner.* 316, 49, 50-E7 (1987)
- Narrow-Angle Tail Radio Sources and the Distribution of Galaxy Orbits in Abell Clusters. *Christopher P. O'Dea, Craig L. Sarazin, and Frazer N. Owen.* 316, 113, 51-C1 (1987)
- Cosmological Accretion Wakes. *Edmund Bertschinger.* 316, 489, 57-D1 (1987)
- The Faraday Rotation of Cygnus A: Magnetic Fields in Cluster Gas. *J. W. Dreher, C. L. Carilli, and R. A. Perley.* 316, 611, 58-F7 (1987)
- Gravitational Lensing by an Ensemble of Isothermal Galaxies. *Neal Katz and Bohdan Paczyński.* 317, 11, 64-B3 (1987)
- Gravitational Clustering and the Origin of the Correlation Function of Clusters of Galaxies. *A. Kashlinsky.* 317, 19, 64-B11 (1987)
- Dark Matter in the Universe: Massive Neutrinos Revisited. *R. Cowsik and P. Ghosh.* 317, 26, 64-C4 (1987)
- 1.4 GHz Continuum Sources in the Cancer Cluster. *E. E. Salpeter and J. M. Dickey.* 317, 102, 65-B1 (1987)
- Preliminary VLA Limits on the Sunyaev-Zel'dovich Effect in Abell 2218. *R. B. Partidge, R. A. Perley, N. Mandolesi, and F. Delpino.* 317, 112, 65-B11 (1987)
- Does Lower Ω Allow a Resolution of the Large-Scale Structure Problem? *Joseph Silk and Nicola Vittorio.* 317, 564, 72-C8 (1987)
- A Fluid Model for the Evolution of Large-Scale Structure. *P. J. E. Peebles.* 317, 576, 72-D8 (1987)
- The Local Extragalactic Velocity Field, the Local Mean Mass Density, and Biased Galaxy Formation. *M. E. Brown and P. J. E. Peebles.* 317, 588, 72-E6 (1987)
- Are the Virial Masses of Clusters Smaller Than We Think? *L. L. Cowie, M. Henriksen, and R. Mushotzky.* 317, 593, 72-E11 (1987)
- Substructure in the Coma Cluster. *Michael Fitchett and Rachel Webster.* 317, 653, 73-C1 (1987)
- Alignment Statistics of Clusters with Their Brightest Members at Bright and Faint Isophotes. *Mitchell F. Struble.* 317, 668, 73-D2 (1987)
- The Distribution of Gas and Galaxies around the Distant Quasar PKS 1614 + 051. *Esther M. Hu and Lennox L. Cowie.* 317, L7, 71-A9 (1987)
- Star Formation in X-Ray Cluster Cooling Flows. *Raymond E. White III and Craig L. Sarazin.* 318, 612, 87-E9 (1987)
- Determining Star Formation Rates in X-Ray Cluster Cooling Flows. *Raymond E. White III and Craig L. Sarazin.* 318, 621, 87-F5 (1987)
- Numerical Models of Star Formation in X-Ray Cluster Cooling Flows. *Raymond E. White III and Craig L. Sarazin.* 318, 629, 87-F14 (1987)
- Extraction of Cosmological Information from Multiimage Gravitational Lenses. *Israel Kover.* 318, L1, 85-A4 (1987)
- A Quantitative Approach to the Topology of Large-Scale Structure. *J. Richard Gott III, David H. Weinberg, and Adrian L. Melott.* 319, 1, 93-A7 (1987)
- Surveys of Fields around Quasars. IV. Luminosity of Galaxies at $z \geq 0.6$ and Preliminary Evidence for the Evolution of the Environment of Radio-loud Quasars. *H. K. C. Yee and Richard F. Green.* 319, 28, 93-C12 (1987)
- Spartan 1 X-Ray Observations of the Perseus Cluster: Comparison of the Iron Abundances and Temperatures in the Inner and Outer Regions of the Cluster. *M. P. Ulmer, R. G. Cruddace, E. E. Fenimore, G. G. Fritz, and W. A. Snyder.* 319, 118, 94-C11 (1987)
- Angular Momentum from Tidal Torques. *Joshua Barnes and George Efstathiou.* 319, 575, 101-C1 (1987)
- On the Thermal Instability of Galactic and Cluster Halos. *A. Malagoli, R. Rosner, and G. Bodo.* 319, 622, 101-G8 (1987)
- B2 0800 + 24: A Narrow-Angle Tail Radio Galaxy in a Small Group of Galaxies. *John T. Stocke and Jack O. Burns.* 319, 671, 102-C8 (1987)
- Void Probabilities in the Galaxy Distribution: Scaling and Luminosity Segregation. *Sophie Maurogordato and Marc Lachièze-Rey.* 320, 13, 108-B5 (1987)
- 21 Centimeter Study of Spiral Galaxies in the Coma Supercluster. *Giuseppe Gavazzi.* 320, 96, 109-B3 (1987)
- HEAO 1 Hard X-Ray Observations of Three Abell Clusters of Galaxies. *Y. Rephaeli, D. E. Gruber, and R. E. Rothschild.* 320, 139, 109-E5 (1987)
- On the Validity of the Zel'dovich Approximation. *Benjamin Grinstein and Mark B. Wise.* 320, 448, 114-C11 (1987)
- $z_{\text{abs}} \sim z_{\text{em}}$ Absorption Systems in Quasar Spectra: A Correlation with Radio and Optical Luminosity? *Palle Möller and Peter Jakobsen.* 320, L75, 121-A9 (1987)
- The Topology of Large-Scale Structure. Topology and the Random Phase Hypothesis. *David H. Weinberg, J. Richard Gott III, and Adrian L. Melott.* 321, 2, 122-A8 (1987)
- Cosmic Fluctuation Spectra with Large-Scale Power. *J. M. Bardeen, J. R. Bond, and G. Efstathiou.* 321, 28, 122-D1 (1987)
- Nearby Groups of Galaxies. II. An All-Sky Survey within 3000 Kilometers per Second. *R. Brent Tully.* 321, 280, 125-C7 (1987)
- The Morphology of the Rich Supercluster 1451 + 22. *Robin Ciardullo.* 321, 607, 131-C1 (1987)
- The Dynamics of Small Groups of Galaxies. I. Virialized Groups. *Gary A. Mamon.* 321, 622, 131-D2 (1987)
- Far-Infrared Properties of Cluster Galaxies. *Michael D. Bica and Riccardo Giovanelli.* 321, 645, 131-E11 (1987)
- The Marginal Gravitational Lensing. *Israel Kover.* 321, 686, 132-A13 (1987)
- Cosmic String Waves. *Albert Stebbins, Shoba Veeraraghavan, Robert Brandenberger, Joseph Silk, and Neil Turok.* 322, 1, 138-A7 (1987)
- Comparisons of the Spatial Distribution of Abell Clusters against Models with Gaussian Initial Conditions. *David J. Batuski, Adrian L. Melott, and Jack O. Burns.* 322, 48, 138-D12 (1987)
- Absorption in the Wide QSO Pair Tololo 1037 - 2704 and Tololo 1038 - 2712: Evidence for a Specially Aligned Supercluster at $z = 2$? *Wallace L. W. Sargent and Charles C. Steidel.* 322, 142, 139-D11 (1987)
- Properties of Dense Galaxy Groups and the Implications of Their Existence. *Jack W. Sulentic.* 322, 605, 146-D7 (1987)
- More About Clustering on a Scale of 0.1 c. *R. Brent Tully.* 323, 1, 153-A7 (1987)
- Optical Bias and Hierarchical Clustering. *Silvio A. Bonometto, Francesco Lucchin, and Sabino Matarrese.* 323, 19, 153-C6 (1987)
- Double Inflation: A Possible Resolution of the Large-Scale Structure Problem. *Michael S. Turner, Jens V. Villumsen, Nicola Vittorio, Joseph Silk, and Roman Juszkiewicz.* 323, 423, 159-C1 (1987)
- Results from a Visual Survey of All 2712 Abell Clusters. *Mitchell F. Struble and Herbert J. Rood.* 323, 468, 159-F4 (1987)
- Multiaperture Spectroscopy of Galaxies in Abell 370. *J. Patrick Henry and Russell J. Lavery.* 323, 473, 159-F9 (1987)
- An Imaging Study of NGC 1275 and PKS 0745 - 191: Vigorous Star Formation in Cooling Flow Cluster Dominant Galaxies. *W. Romanishin.* 323, L113, 164-B9 (1987)
- Extraction of Cosmological Information from Multiimage Gravitational Lenses: Erratum. *Israel Kover.* 323, L155, 164-E13 (1987) (Orig. paper in 318, L1, 85-A4)
- H I Detection Survey of a Complete Magnitude-limited Sample of Dwarf Irregular Galaxies in the Virgo Cluster Area. *G. Lyle Hoffman, George Helou, E. E. Salpeter, John Glosson, and A. Sandage.* 63, 247, 4-A5 (1987) (Abstr. in 312, 964, 13-E5)
- Neutral Hydrogen in Compact Groups of Galaxies. *B. A. Williams and Herbert J. Rood.* 63, 265, 4-C8 (1987) (Abstr. in 312, 964, 13-E5)
- A Compilation of Redshifts and Velocity Dispersions for Abell Clusters. *Mitchell F. Struble and Herbert J. Rood.* 63, 543, 9-C7 (1987) (Abstr. in 313, 928, 26-G11)
- A Catalog of Morphological Properties of the 2712 Abell Clusters. *Mitchell F. Struble and Herbert J. Rood.* 63, 555, 9-D4 (1987) (Abstr. in 313, 929, 26-G12)
- Mass-to-Light Ratios of Binary Galaxies. I. Radial Velocities. *Linda Y. Schweizer.* 64, 411, 22-D3 (1987) (Abstr. in 316, 859, 61-E1)
- Mass-to-Light Ratios of Binary Galaxies. II. Photoelectric BV Photometry. *Linda Y. Schweizer.* 64, 417, 22-D9 (1987) (Abstr. in 316, 860, 61-E2)
- Mass-to-Light Ratios of Binary Galaxies. III. Analysis. *Linda Y.*

- Schweizer. **64**, 427, 22-E4 (1987) (Abstr. in **316**, 860, 61-E2)
 Isophotal Diameters of Cluster Spirals. *M. E. Cornell, M. Aaronson, G. Bothum, and J. Mould*. **64**, 507, 24-A5 (1987) (Abstr. in **317**, 1002, 77-B5)
 The Structure of Brightest Cluster Members. II. Mergers. *James M. Schombert*. **64**, 643, 26-G2 (1987) (Abstr. in **318**, 945, 91-C10)
- Galaxies: Distances**
 Spectroscopy and Photometry of Elliptical Galaxies. I. New Distance Estimator. *Alan Dressler, Donald Lynden-Bell, David Burstein, Roger L. Davies, S. M. Faber, Roberto Terlevich, and Gary Wegner*. **313**, 42, 15-D7 (1987)
 Spectroscopy and Photometry of Elliptical Galaxies: A Large-Scale Streaming Motion in the Local Universe. *Alan Dressler, S. M. Faber, David Burstein, Roger L. Davies, Donald Lynden-Bell, R. J. Terlevich, and Gary Wegner*. **313**, L37, 27-A9 (1987)
 Observations of RR Lyrae Stars in the Halo of M31. *Christopher J. Pritchet and Sidney van den Bergh*. **316**, 517, 57-F2 (1987)
 The $Dn-\sigma$ Relation for Bulges of Disk Galaxies: A New, Independent Measure of the Hubble Constant. *Alan Dressler*. **317**, 1, 64-A7 (1987)
 The Redshift-Distance Relation. IXa. Reinterpretation of the Local Group Deceleration Data Emphasizing the Kahn-Woltjer Mass Determination. *Allan Sandage*. **317**, 557, 72-C1 (1987)
 Extraction of Cosmological Information from Multiimage Gravitational Lenses. *Israel Kover*. **318**, L1, 85-A4 (1987)
 Near-Infrared Observations of Cepheids: The Distance to NGC 300. *Barry F. Madore, Douglas L. Welch, C. W. McAlary, and R. A. McLaren*. **320**, 26, 108-C4 (1987)
 The Stellar Populations of Shapley Constellation III. *Neill Reid, Jeremy Mould, and Ian Thompson*. **323**, 433, 159-C11 (1987)
 Extraction of Cosmological Information from Multiimage Gravitational Lenses: Erratum. *Israel Kover*. **323**, L155, 164-E13 (1987) (Orig. paper in **318**, L1, 85-A4)
 A Catalog of Morphological Properties of the 2712 Abell Clusters. *Mitchell F. Struble and Herbert J. Rood*. **63**, 555, 9-D4 (1987) (Abstr. in **313**, 929, 26-G12)
- Galaxies: Evolution**
 Imaging Spectroscopy of Five QSOs. *Paul Hickson and J. B. Hutchings*. **312**, 518, 8-E6 (1987)
 Compact Molecular Gas Structure in the Interacting Galaxy Pair Arp 299 (IC 694-NGC 3690). *A. I. Sargent, D. B. Sanders, N. Z. Scoville, and B. T. Soifer*. **312**, L35, 14-B1 (1987)
 The Evolution of Active Galactic Nuclei. I. Models without Stellar Evolution. *Laurence P. David, Richard H. Durisen, and Haldan N. Cohn*. **313**, 556, 22-G9 (1987)
 The Shape of the Dark Halo in Polar-Ring Galaxies. *Bradley C. Whitmore, Douglas B. McElroy, and François Schweizer*. **314**, 439, 34-C9 (1987)
 Galactic Chemical Evolution: z versus $\lambda n(1/\mu)$ Relationship. *Donald D. Clayton*. **315**, 451, 45-F1 (1987)
 Color Evolution in High-Redshift Galaxies. *Peter R. M. Eisenhardt and M. J. Lebofsky*. **316**, 70, 50-F14 (1987)
 The Evolution of Active Galactic Nuclei. II. Models with Stellar Evolution. *Laurence P. David, Richard H. Durisen, and Haldan N. Cohn*. **316**, 505, 57-E4 (1987)
 Isophotal Diameters of Galaxies at High Redshifts. *Daniel W. Weedman and Karen L. Williams*. **318**, 585, 87-C10 (1987)
 Interpretation of Deep Counts of Radio Sources. *L. Danese, G. De Zotti, A. Franceschini, and L. Toffolatti*. **318**, L15, 85-B2 (1987)
 Nonlinear Coupling of Galactic Spiral Modes. *M. Tagger, J. F. Sygnet, E. Athanassoula, and R. Pellat*. **318**, L43, 92-B4 (1987)
 Surveys of Fields around Quasars. IV. Luminosity of Galaxies at $z \geq 0.6$ and Preliminary Evidence for the Evolution of the Environment of Radio-loud Quasars. *H. K. C. Yee and Richard F. Green*. **319**, 28, 93-C12 (1987)
 The Red/Infrared Evolution in Galaxies—Effects of the Stars on the Asymptotic Giant Branch. *Arati Chokshi and Edward L. Wright*. **319**, 44, 93-E1 (1987)
 Bimodal Star Formation: Constraints from Galaxy Colors at High Redshift. *Rosemary F. G. Wyse and Joseph Silk*. **319**, L1, 100-A4 (1987)
 The Structure and Evolution of Hoag's Object. *François Schweizer, W. Kent Ford, Jr., Robert Jedrzejewski, and Riccardo Giovanelli*. **320**, 454, 114-D3 (1987)
 A Search for Primeval Galaxies Using a Narrow-Band Imaging Technique. *C. J. Pritchet and F. D. A. Hartwick*. **320**, 464, 114-E2 (1987)
 The Dynamics of Small Groups of Galaxies. I. Virialized Groups. *Gary A. Mamon*. **321**, 622, 131-D2 (1987)
 Nuclear Chronometers from the r -Process and the Age of the Galaxy. *John J. Cowan, F.-K. Thielemann, and J. W. Truran*. **323**, 543, 160-F1 (1987)
 Forbidden [O II] and [O III] Emission 29'' from a QSO Absorption-Line Region. *Brian Yanny, Don Hamilton, R. A. Schommer, T. B. Williams, and D. G. York*. **323**, L19, 158-B7 (1987)
 Continuum Models for Gas in Disturbed Galaxies. III. Bifurcations and Chaos in a Deterministic Model for Bursts of Star Formation. *Curtis Struck-Marcell and John M. Scalzo*. **64**, 39, 17-D11 (1987) (Abstr. in **315**, 730, 48-E11)
- Galaxies: Formation**
 Multipole Anisotropies of the Cosmic Background Radiation and Inflationary Models. *R. Fabbri, F. Lucchin, and S. Matarrese*. **315**, 1, 40-A7 (1987)
 New Limits to Bias and the Amount of Dark Matter in the Universe. *William C. Saslaw, H. M. Antia, and S. M. Chitre*. **315**, L1, 45-A4 (1987)
 Cosmic Background Temperature Anisotropy in a Minimal Isocurvature Model for Galaxy Formation. *P. J. E. Peebles*. **315**, L73, 49-A11 (1987)
 The Spatial Distribution of Dwarf Galaxies in the CfA Slice of the Universe. *Trinh X. Thuan, J. Richard Gott III, and Stephen E. Schneider*. **315**, L93, 49-C2 (1987)
 Profiles of Clusters of Galaxies: Cosmological Scenarios versus Observations. *Michael J. West, Avishai Dekel, and Augustus Oemler, Jr.*. **316**, 1, 50-A8 (1987)
 Cosmological Accretion Wakes. *Edmund Bertschinger*. **316**, 489, 57-D1 (1987)
 On the Applicability of the Statistical Mechanical Theories of Violent Relaxation. *Jes Madsen*. **316**, 497, 57-D9 (1987)
 On Statistical Mechanical Theories of Violent Relaxation. *Frank H. Shu*. **316**, 502, 57-E1 (1987)
 Does Lower Ω Allow a Resolution of the Large-Scale Structure Problem? *Joseph Silk and Nicola Vittorio*. **317**, 564, 72-C8 (1987)
 The Local Extragalactic Velocity Field, the Local Mean Mass Density, and Biased Galaxy Formation. *M. E. Brown and P. J. E. Peebles*. **317**, 588, 72-E6 (1987)
 The Distribution of Gas and Galaxies around the Distant Quasar PKS 1614 + 051. *Esther M. Hu and Lennox L. Cowie*. **317**, L7, 71-A9 (1987)
 Galaxy Formation by Gravitational Collapse. *Barbara S. Ryden and James E. Gunn*. **318**, 15, 79-B5 (1987)
 Hydrogen Molecules and the Radiative Cooling of Pregalactic Shocks. *Paul R. Shapiro and Hyesung Kang*. **318**, 32, 79-C8 (1987)
 Angular Momentum from Tidal Torques. *Joshua Barnes and George Efstathiou*. **319**, 575, 101-C1 (1987)
 Bimodal Star Formation: Constraints from Galaxy Colors at High Redshift. *Rosemary F. G. Wyse and Joseph Silk*. **319**, L1, 100-A4 (1987)
 Extended Lyman- α Emission in 3C 326.1: A 100 Kiloparsec Cloud of Ionized Gas at a Redshift of 1.82. *Patrick J. McCarthy, Hyron Spinrad, S. Djorgovski, Michael A. Strauss, Wil van Breugel, and James Liebert*. **319**, L39, 107-B2 (1987)
 Large-Scale Structure from Cosmic String Loops. I. Formation and Linear Evolution of Perturbations. *Robert J. Scherrer*. **320**, 1, 108-A7 (1987)
 A Search for Primeval Galaxies Using a Narrow-Band Imaging Technique. *C. J. Pritchet and F. D. A. Hartwick*. **320**, 464, 114-E2 (1987)
 On Entropy and Stellar Systems. *Herwig Dejonghe*. **320**, 477, 114-F3 (1987)
 The Formation of the Exponential Disk in Spiral Galaxies. *D. N. C. Lin and J. E. Pringle*. **320**, L87, 121-B6 (1987)
 The Topology of Large-Scale Structure. Topology and the Random Phase Hypothesis. *David H. Weinberg, J. Richard Gott III, and Adrian L. Melott*. **321**, 2, 122-A8 (1987)
 A Correlation between the Radio and Optical Morphologies of Distant 3CR Radio Galaxies. *Patrick J. McCarthy, Wil van Breugel, Hyron Spinrad, and S. Djorgovski*. **321**, L29, 129-D3 (1987)
 Cosmic String Waves. *Albert Stebbins, Shoba Veeraraghavan, Robert Brandenberger, Joseph Silk, and Neil Turok*. **322**, 1, 138-A7 (1987)
 The Origin of the Diffuse X-Ray Background and the Formation of Galaxies and Voids. *Ruth A. Daly*. **322**, 20, 138-B12 (1987)
 The Appearance of Primeval Galaxies. *E. Baron and Simon D. M. White*. **322**, 585, 146-C1 (1987)
 On the Origin of Dwarf Galaxies. *Joseph Silk, Rosemary F. G. Wyse, and G. A. Shields*. **322**, L59, 152-A9 (1987)
 Path Integral Methods for Primordial Density Perturbations: Sampling of Constrained Gaussian Random Fields. *Edmund Bertschinger*. **323**, L103, 164-A14 (1987)
 Primeval Galaxies and Cold Dark Matter. *Joseph Silk and Alexander Szalay*. **323**, L107, 164-B4 (1987)
- Galaxies: General**
 Detection of CO(1 \rightarrow 0) Emission and Optical Imaging of the Seyfert Galaxy/QSO Markarian 231. *D. B. Sanders, J. S. Young, N. Z. Scoville, B. T. Soifer, and G. E. Danielson*. **312**, L5, 7-A8 (1987)

Forbidden [O II] and [O III] Emission 29'' from a QSO Absorption-Line

Galaxies: General—Continued

- Interstellar Dust in Shapley-Ames Elliptical Galaxies. *M. Jura, D. W. Kim, G. R. Knapp, and P. Guhathakurta.* **312**, L11, 7-A13 (1987)
- Compact Molecular Gas Structure in the Interacting Galaxy Pair Arp 299 (IC 694—NGC 3690). *A. I. Sargent, D. B. Sanders, N. Z. Scoville, and B. T. Soifer.* **312**, L35, 14-B1 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies: A Large-Scale Streaming Motion in the Local Universe. *Alan Dressler, S. M. Faber, David Burstein, Roger L. Davies, Donald Lynden-Bell, R. J. Terlevich, and Gary Wegner.* **313**, L37, 27-A9 (1987)
- A Gamma-Ray Constraint on the Nature of Dark Matter. *Joseph Silk and Hans Bloemen.* **313**, L47, 27-B5 (1987)
- Arm Classifications for Spiral Galaxies. *Debra Meloy Elmegreen and Bruce G. Elmegreen.* **314**, 3, 28-A10 (1987)
- Globular Cluster Systems in the Supergiant Ellipticals of the Coma Cluster. *William E. Harris.* **315**, L29, 45-C6 (1987)
- The Thick Gravitational Lens: A Lens Composed of Many Elements at Different Distances. *Israel Kowner.* **316**, 52, 50-E10 (1987)
- Discovery of Broad Brackett- α Emission in Arp 220. *D. L. DePoy, E. E. Becklin, and T. R. Geballe.* **316**, L63, 62-B8 (1987)
- Dust Distribution in Spiral Galaxies. *Nikolaos D. Kylafis and John N. Bahcall.* **317**, 637, 73-A13 (1987)
- Observations of Novae in the Virgo Cluster. *Christopher J. Pritchett and Sidney van den Bergh.* **318**, 507, 86-D7 (1987)
- Simulations of Axisymmetric, Newtonian Star Clusters: Prelude to 2 + 1 General Relativistic Computations. *Stuart L. Shapiro and Saul A. Teukolsky.* **318**, 542, 86-G1 (1987)
- Subluminous Type I Supernovae: Their Theoretical Rate in Our Galaxy and in Ellipticals. *A. Tornambè and F. Matteucci.* **318**, L25, 85-B12 (1987)
- Evidence of an Infrared Luminosity Indicator for Galaxies. *Eric D. Feigelson, Takashi Ito, and Daniel W. Weedman.* **319**, L51, 107-C4 (1987)
- Infrared Emission and Star Formation in Early-Type Galaxies. *Harley A. Thronson, Jr. and John Bally.* **319**, L63, 107-D1 (1987)
- The IRAS Bright Galaxy Sample. II. The Sample and Luminosity Function. *B. T. Soifer, D. B. Sanders, B. F. Madore, G. Neugebauer, G. E. Danielson, J. H. Elias, Carol J. Lonsdale, and W. L. Rice.* **320**, 238, 110-F7 (1987)
- Searching at 21 Centimeters for Galaxies behind the Milky Way. *Frank J. Kerr and Patricia A. Henning.* **320**, L99, 121-C2 (1987)
- The Marginal Gravitational Lensing. *Israel Kowner.* **321**, 686, 132-A13 (1987)
- The Extraordinary CO Luminosity of the Far-Infrared Galaxy VII Zw 31: A Possible Proto-Galactic Disk? *Leslie J. Sage and P. M. Solomon.* **321**, L103, 137-A9 (1987)
- Concerning the Limit on the Mean Mass Distribution of Galaxies from Their Gravitational Lens Effect. *Israel Kowner and Mordehai Milgrom.* **321**, L113, 137-B5 (1987)
- The Case Low-Dispersion Northern Sky Survey. IV. Galaxies in the Bootes Void Region. *N. Sanduleak and Peter Pesch.* **63**, 809, 13-F6 (1987) (Abstr. in **314**, 831, 38-F7)
- Galaxies: Individual (arranged by Messier number, NGC number, and by Other Designations)**
- By Messier Number*
- The X-Ray Spectral Properties of the Bulge of M31. *G. Fabbiano, G. Trinchieri, and L. S. Van Speybroeck.* **316**, 127, 51-D1 (1987)
- Observations of RR Lyrae Stars in the Halo of M31. *Christopher J. Pritchett and Sidney van den Bergh.* **316**, 517, 57-F2 (1987)
- Dynamics of the Outer Disk and Halo of M31. *Richard Nolthenius and Holland C. Ford.* **317**, 62, 64-E13 (1987)
- The Spatial Distribution and Population of Novae in M31. *Robin Ciardullo, Holland C. Ford, James D. Neill, George H. Jacoby, and Allen W. Shafter.* **318**, 520, 86-E6 (1987)
- [M31] Wolf-Rayet Stars in the Andromeda Galaxy. *Anthony F. J. Moffat and Michael M. Shara.* **320**, 266, 111-A9 (1987)
- Giant Molecular Clouds in M31. *S. N. Vogel, F. Boulanger, and R. Ball.* **321**, L145, 137-D8 (1987)
- The M31 Globular Cluster System: Erratum. *D. Crampton, A. P. Cowley, D. Schade, and P. Chayer.* **322**, 1074, 151-F12 (1987) (Orig. paper in **288**, 494, 8-B2)
- Are There Stellar Winds in the Hot Stars of M31? *J. B. Hutchings, Philip Massey, and L. Bianchi.* **322**, L79, 152-B13 (1987)
- A Central Black Hole in M32. *John L. Tonry.* **322**, 932, 146-F7 (1987)
- A Radio Search for Crab-like Nebulae in M33. *Stephen P. Reynolds and John D. Fix.* **322**, 673, 147-B7 (1987)
- H₂O Maser Emission from the Nuclei of NGC 253 and M51. *Paul T. P. Ho, Robert N. Martin, Christian Henkel, and Jean L. Turner.* **320**, 663, 117-A12 (1987)
- Deconvolution of Elliptical Nuclei of Galaxies: Application to M81: Erratum. *O. Bendenelli, G. Parmeggiani, and T. Zavatti.* **315**, 408, 44-C14 (1987) (Orig. paper in **308**, 611, 115-E14)
- The Composition Gradient across M81. *D. R. Garnett and G. A. Shields.* **317**, 82, 64-G7 (1987)
- Giant H II Regions in M81. *Michele Kaufman, Frank N. Bash, R. C. Kennicutt, Jr., and P. W. Hodge.* **319**, 61, 93-F7 (1987)
- Molecular Gas in the Starburst Nucleus of M82. *K. Y. Lo, K. W. Cheung, C. R. Masson, T. G. Phillips, S. L. Scott, and D. P. Woody.* **312**, 574, 9-B7 (1987)
- IRAS Large-Beam and Ground-Based Small-Beam Measurements of the Unidentified 11.3 and [Ne II] 12.8 Micron Line Fluxes in the Starburst Galaxy M82. *P. D. LeVan and S. D. Price.* **312**, 592, 9-D1 (1987)
- Far-Infrared Spectroscopy of Star Formation Regions in M82. *P. B. Duffy, E. F. Erickson, M. R. Haas, and J. R. Houck.* **315**, 68, 40-F6 (1987)
- Infrared Emission from Young Stars in the Nucleus of M82. *Marshall Joy, Daniel F. Lester, and Paul M. Harvey.* **319**, 314, 96-D5 (1987)
- VLBI Observations of 23 Hot Spots in the Starburst Galaxy M82. *N. Bartel, M. I. Ratner, A. E. E. Rogers, I. I. Shapiro, R. J. Bonometti, N. L. Cohen, M. V. Gorenstein, J. M. Marcaide, and R. A. Preston.* **323**, 505, 160-B3 (1987)
- Recombination Spectroscopy of Star-Formation Regions in the Nucleus of M83. *Jean L. Turner, Paul T. P. Ho, and Sara C. Beck.* **313**, 644, 23-G2 (1987)
- X-Rays from the Radio Halo of M87. *E. D. Feigelson, P. A. D. Wood, E. J. Schreier, D. E. Harris, and M. J. Reid.* **312**, 101, 2-B5 (1987)
- Dynamical Instability of a Model of M87. *David Merritt.* **319**, 55, 93-E14 (1987)
- By NGC Number*
- The Late-Type Stellar Content of NGC 55. *Christopher J. Pritchett, Harvey B. Richer, David Schade, Dennis Crabtree, and H. K. C. Yee.* **323**, 79, 154-A3 (1987)
- H₂O Maser Emission from the Nuclei of NGC 253 and M51. *Paul T. P. Ho, Robert N. Martin, Christian Henkel, and Jean L. Turner.* **320**, 663, 117-A12 (1987)
- Near-Infrared Observations of Cepheids: The Distance to NGC 300. *Barry F. Madore, Douglas L. Welch, C. W. McAlary, and R. A. McLaren.* **320**, 26, 108-C4 (1987)
- [NGC 891] Dust Distribution in Spiral Galaxies. *Nikolaos D. Kylafis and John N. Bahcall.* **317**, 637, 73-A13 (1987)
- Structure in the Nucleus of NGC 1068 at 10 Microns. *R. Tresch-Fienberg, G. G. Fazio, D. Y. Gezari, W. F. Hoffmann, G. M. Lamb, P. K. Shu, and C. R. McCreight.* **312**, 542, 8-G2 (1987)
- The X-Ray Spectrum of NGC 1068. *R. Monier and J. P. Halpern.* **315**, L17, 45-B6 (1987)
- Kinematics and Ionization of Extended Gas in Active Galaxies. III. The Extranuclear Properties of NGC 1068. *J. A. Baldwin, A. S. Wilson, and Mark Whittle.* **319**, 84, 94-A3 (1987)
- [NGC 1068] A Radiative Bow Shock Wave (?) Driven by Nuclear Ejecta in a Seyfert Galaxy. *Andrew S. Wilson and James S. Ulvestad.* **319**, 105, 94-B11 (1987)
- Far-Infrared Continuum Emission from the Nucleus, Starburst, and Extended Spiral Arms of NGC 1068. *D. F. Lester, M. Joy, P. M. Harvey, H. B. Ellis, Jr., and P. S. Parmar.* **321**, 755, 132-G1 (1987)
- Astrophysical Implications of the Multifrequency VLA Observations of NGC 1265. *Christopher P. O'Dea and Frazer N. Owen.* **316**, 95, 51-A11 (1987)
- [NGC 1275] Spartan 1 X-Ray Observations of the Perseus Cluster: Comparison of the Iron Abundances and Temperatures in the Inner and Outer Regions of the Cluster. *M. P. Ulmer, R. G. Cruddace, E. E. Fenimore, G. G. Fritz, and W. A. Snyder.* **319**, 118, 94-C11 (1987)
- [NGC 1275] VLBI Structure of 3C 84 at 89 GHz. *D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman.* **322**, 74, 138-F11 (1987)
- A Near-Infrared Study of the Luminous Merging Galaxies NGC 2623 and Arp 148. *Marshall Joy and Paul M. Harvey.* **315**, 480, 46-A4 (1987)
- Evidence for Ram Pressure Stripping of NGC 3073 by Outflowing Gas from NGC 3079. *Judith A. Irwin, E. R. Seaquist, A. R. Taylor, and N. Duric.* **313**, L91, 27-E3 (1987)
- Evidence for Ram Pressure Stripping of NGC 3073 by Outflowing Gas from NGC 3079. *Judith A. Irwin, E. R. Seaquist, A. R. Taylor, and N. Duric.* **313**, L91, 27-E3 (1987)
- Broad, Variable Absorption Lines in the Seyfert Galaxy NGC 3516: Probing the Structure of the Emission-Line Regions. *G. Mark Voit, J. Michael Shull, and Mitchell C. Begelman.* **316**, 573, 58-C5 (1987)
- The Leo Triplet Spiral Galaxy NGC 3628. I. VLA Observations of the Neutral Hydrogen Absorption. *J. T. Schmelz, W. A. Baan, and A. D. Haschick.* **315**, 492, 46-B3 (1987)
- The Leo Triplet Spiral Galaxy NGC 3628. II. VLA Observations of the

- Hydroxyl Absorption. *J. T. Schmelz, W. A. Baan, and A. D. Haschick.* **320**, 145, 109-E11 (1987)
- [NGC 3923] Shell Galaxies and Alternatives to the Dark Matter Hypothesis. *Lars Hernquist and P. J. Quinn.* **312**, 17, 1-B9 (1987)
- NGC 3928: A Highly Bulge-dominated Compact Spiral Galaxy. *Yoshiaki Taniguchi and Masaaki Watanabe.* **313**, 89, 16-A5 (1987)
- A Detailed Study of the C IV λ 1550 Line Profile and Adjacent Spectral Features in NGC 4151 from 1978 to 1983. *J. Clavel, A. Altamore, A. Boksenberg, G. E. Bromage, A. Elvius, D. Pelat, M. V. Penston, G. C. Perola, M. A. J. Snijders, and M. H. Ulrich.* **321**, 251, 125-A5 (1987)
- The Galaxy-Quasar Connection: NGC 4319 and Markarian 205. I. Direct Imagery. *Jack W. Sulentic and Halton Arp.* **319**, 687, 102-D12 (1987)
- The Galaxy-Quasar Connection: NGC 4319 and Markarian 205. II. Spectroscopy. *Jack W. Sulentic and Halton Arp.* **319**, 693, 102-E10 (1987)
- Star Formation in the Magellanic Irregular Galaxy NGC 4449. *Harley A. Thronson, Jr., Deidre A. Hunter, C. M. Telesco, D. A. Harper, and R. Decher.* **317**, 180, 66-A3 (1987)
- H I Gas near the Giant Elliptical Galaxy NGC 4472. *R. Sancisi, N. Thonnard, and R. D. Ekers.* **315**, L39, 45-D8 (1987)
- Detection of Retrograde Gas Streaming in the SB0 Galaxy NGC 4546. *G. Galletta.* **318**, 531, 86-F3 (1987)
- [NGC 4650A] The Shape of the Dark Halo in Polar-Ring Galaxies. *Bradley C. Whitmore, Douglas B. McElroy, and François Schweizer.* **314**, 439, 34-C9 (1987)
- [NGC 4697] Weak Disks in Rapidly Rotating Elliptical Galaxies. *D. Carter.* **312**, 514, 8-E2 (1987)
- [NGC 4736] Isophotal Diameters of Galaxies at High Redshifts. *Daniel W. Weedman and Karen L. Williams.* **318**, 585, 87-C10 (1987)
- High-Resolution Imaging from Mauna Kea: Globular Clusters in the Coma Cluster Galaxy NGC 4874. *Laird A. Thompson and Francisco Valdes.* **315**, L35, 45-C14 (1987)
- Magnesium Gradients in Elliptical Galaxies. II. NGC 4881. *Bjarne Thomsen and William A. Baum.* **315**, 460, 45-F10 (1987)
- [NGC 5128] Centaurus A Observation at MeV- Gamma-Ray Energies. *P. von Ballmoos, R. Diehl, and V. Schönfelder.* **312**, 134, 2-D11 (1987)
- Nitrogen Abundances in the Amorphous Galaxy NGC 5253. *Jeremy R. Walsh and Jean-René Roy.* **319**, L57, 107-C9 (1987)
- NGC 5266: An Elliptical Galaxy with a Dust Ring. *S. R. Varnas, F. Bertola, G. Galletta, K. C. Freeman, and D. Carter.* **313**, 69, 15-F12 (1987)
- Variability of the Optical Spectrum of NGC 5548 and Evidence for a Multiple-Component Broad-Line Region. *Bradley M. Peterson.* **312**, 79, 1-G11 (1987)
- The Double Broad-Line Emitting Regions in NGC 5548 as Possible Evidence for a Supermassive Binary. *Bradley M. Peterson, Kirk T. Korista, and Stephen A. Cota.* **312**, L1, 7-A4 (1987)
- The Structure and Dynamics of Ringed Galaxies. IV. Surface Photometry and Kinematics of the Ringed Barred Spiral NGC 6300. *R. Buta.* **64**, 383, 22-A5 (1987) (Abstr. in **316**, 859, 61-E1)
- The Structure and Dynamics of Ringed Galaxies. III. Surface Photometry and Kinematics of the Ringed Nonbarred Spiral NGC 7531. *R. Buta.* **64**, 1, 17-A5 (1987) (Abstr. in **315**, 730, 48-E11)
- By Other Designations: Names*
- A Near-Infrared Study of the Luminous Merging Galaxies NGC 2623 and Arp 148. *Marshall Joy and Paul M. Harvey.* **315**, 480, 46-A4 (1987)
- [Arp 220] The 18 Centimeter OH Emission of IC 4553 (Arp 220). *Willem A. Baan and Aubrey D. Haschick.* **318**, 139, 80-D10 (1987)
- CO Emission from Centaurus A. *T. G. Phillips, B. N. Ellison, J. B. Keene, R. B. Leighton, R. J. Howard, C. R. Masson, D. B. Sanders, B. Veidt, and K. Young.* **322**, L73, 152-B8 (1987)
- The Reddening of Cygnus A from a Measurement of Paschen-Alpha. *S. J. Lilly and G. J. Hill.* **315**, L103, 49-C12 (1987)
- The Structure and Evolution of Hoag's Object. *François Schweizer, W. Kent Ford, Jr., Robert Jedrzejewski, and Riccardo Giovanelli.* **320**, 454, 114-D3 (1987)
- [IRAS 09595 - 0755] A Seyfert Nucleus of a New Ring Galaxy in Sextans. *Ken-ichi Wakamatsu and Mitsugu T. Nishida.* **315**, L23, 45-B12 (1987)
- Plebeiad Asymmetrical Emission-Line Profiles of a Starburst-Nucleus Galaxy Markarian 52. *Yoshiaki Taniguchi.* **317**, L57, 78-B6 (1987)
- The Galaxy-Quasar Connection: NGC 4319 and Markarian 205. I. Direct Imagery. *Jack W. Sulentic and Halton Arp.* **319**, 687, 102-D12 (1987)
- The Galaxy-Quasar Connection: NGC 4319 and Markarian 205. II. Spectroscopy. *Jack W. Sulentic and Halton Arp.* **319**, 693, 102-E10 (1987)
- The Host Galaxy of Markarian 231. *Donald Hamilton and William C. Keel.* **321**, 121, 124-E1 (1987)
- The Megamaser Galaxy Markarian 273. I. VLA Observations of the Hydroxyl Emission. *J. T. Schmelz, W. A. Baan, and A. D. Haschick.* **321**, 225, 124-F6 (1987)
- Simultaneous Multifrequency Observations of the BL Lacertae Object Markarian 421. *F. Makino, Y. Tanaka, M. Matsuoka, K. Koyama, H. Inoue, K. Makishima, R. Hoshi, S. Hayakawa, Y. Kondo, C. M. Urry, S. L. Mufson, K. R. Hackney, L. R. Hackney, S. Kikuchi, Y. Mikami, W. Z. Wisniewski, N. Hiromoto, M. Nishida, J. Burnell, P. Brand, P. M. Williams, M. G. Smith, F. Takahara, M. Inoue, M. Tsuboi, H. Tabara, T. Kato, M. F. Aller, and H. D. Aller.* **313**, 662, 24-A12 (1987)
- The X-Ray Spectrum of Markarian 509 Observed by EXOSAT. *M. Morini, N. A. Lipani, and D. Molteni.* **317**, 145, 65-E3 (1987)
- A Bright Optical Synchrotron Counterpart of the Western Hot Spot in Pictor A. *Hermann-Josef Rösser and Klaus Meisenheimer.* **314**, 70, 28-G1 (1987)
- By Other Designations: Alphanumeric*
- The Ultraviolet and Optical Emission-Line Spectrum of III Zw 77. *Gary J. Ferland and Donald E. Osterbrock.* **318**, 145, 80-E3 (1987)
- B2 0800 + 24: A Narrow-Angle Tail Radio Galaxy in a Small Group of Galaxies. *John T. Stocke and Jack O. Burns.* **319**, 671, 102-C8 (1987)
- [ESO 0415 - G26] The Shape of the Dark Halo in Polar-Ring Galaxies. *Bradley C. Whitmore, Douglas B. McElroy, and François Schweizer.* **314**, 439, 34-C9 (1987)
- The Peculiar Galaxy IC 4553. II. VLA Observations of the Neutral Hydrogen. *Willem A. Baan, J. H. van Gorkom, Joan T. Schmelz, and I. Felix Mirabel.* **313**, 102, 16-B7 (1987)
- The 18 Centimeter OH Emission of IC 4553 (Arp 220). *Willem A. Baan and Aubrey D. Haschick.* **318**, 139, 80-D10 (1987)
- 92 Centimeter VLBI Structure of the Elliptical Galaxy MCG 5-4-18: Erratum. *J. M. Wrobel and R. S. Simon.* **316**, 858, 61-D14 (1987) (Orig. paper in **309**, 593, 127-F6)
- Linear Polarization Structure of the BL Lacertae Object OJ 287 at Milliarcsecond Resolution. *D. H. Roberts, D. C. Gabuzda, and J. F. C. Wardle.* **323**, 536, 160-E5 (1987)
- Detection of the Lensing Galaxy in PG 1115 + 080. *C. A. Christian, D. Crabtree, and P. Waddell.* **312**, 45, 1-D10 (1987)
- Zw 15107 + 0724 and the Family of OH Megamasers. *Willem A. Baan, Christian Henkel, and Aubrey D. Haschick.* **320**, 154, 109-F6 (1987)
- The Triple Radio Source 0023 + 171: A Candidate for a Dark Gravitational Lens. *J. N. Hewitt, E. L. Turner, C. R. Lawrence, D. P. Schneider, J. E. Gunn, C. L. Bennett, B. F. Burke, J. H. Mahoney, G. I. Langston, M. Schmidt, J. B. Oke, and J. G. Hoessel.* **321**, 706, 132-C5 (1987)
- 1E 0116.3 - 0116: A Peculiar, X-Ray-Bright, Early-Type Galaxy. *D. Maccagni, I. M. Gioia, T. Maccacaro, R. E. Schild, and J. T. Stocke.* **316**, 132, 51-D6 (1987)
- VLBI Structure of 3C 84 at 89 GHz. *D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman.* **322**, 74, 138-F11 (1987)
- VLBI Observations of the 3C 111 Jet. *Roger Linfield.* **317**, 121, 65-C7 (1987)
- The Radio Morphology of 3C 120 on Scales from 0.5 Parsecs to 400 Kiloparsecs. *R. C. Walker, J. M. Benson, and S. C. Unwin.* **316**, 546, 58-A5 (1987)
- The Fading of the Narrow-Line Region in 3C 390.3. *J. Clavel and W. Wamsteker.* **320**, L9, 114-A12 (1987)
- Galaxies: Interactions**
- A Seyfert Nucleus of a New Ring Galaxy in Sextans. *Ken-ichi Wakamatsu and Mitsugu T. Nishida.* **315**, L23, 45-B12 (1987)
- Global Properties of Interacting Disk-Type Galaxies. *Howard A. Bushouse.* **320**, 49, 108-E4 (1987)
- Galaxies: Intergalactic Medium**
- The Intensity Ratio in Different Wave Bands between Images of Gravitationally Lensed Quasars as a Probe of Dark Matter. *Kandaswamy Subramanian and S. M. Chitre.* **313**, 13, 15-B5 (1987)
- The Distribution of Dark Matter in the Coma Cluster. *David Merritt.* **313**, 121, 16-C13 (1987)
- The Effect of the Lyman-Alpha Forest on the Ultraviolet Continuum of Very High Redshift Quasars. *Charles C. Steidel and Wallace L. W. Sargent.* **313**, 171, 16-G7 (1987)
- X-Ray Radiation from the Intergalactic Plasma. *Xavier Barcons.* **313**, 547, 22-F11 (1987)
- H I Gas near the Giant Elliptical Galaxy NGC 4472. *R. Sancisi, N. Thonnard, and R. D. Ekers.* **315**, L39, 45-D8 (1987)
- The Faraday Rotation of Cygnus A: Magnetic Fields in Cluster Gas. *J. W. Dreher, C. L. Carilli, and R. A. Perley.* **316**, 611, 58-F7 (1987)
- On the Physical State of QSO Lyman- α Absorption Clouds. *Craig J.*

Galaxies: Intergalactic Medium—Continued

- Hogan. **316**, L59, 62-B5 (1987)
- Preliminary VLA Limits on the Sunyaev-Zel'dovich Effect in Abell 2218. *R. B. Partridge, R. A. Perley, N. Mandolosi, and F. Delpino.* **317**, 112, 65-B11 (1987)
- The Extragalactic Background Light and a Definitive Resolution of Olbers's Paradox. *Paul S. Wesson, K. Valle, and R. Stabell.* **317**, 601, 72-F5 (1987)
- The Evolution of Cooling Flows. I. Self-similar Cluster Flows. *Roger A. Chevalier.* **318**, 66, 79-E14 (1987)
- A New Upper Limit on the Density of Generally Distributed Intergalactic Neutral Hydrogen. *Charles C. Steidel and Wallace L. W. Sargent.* **318**, L11, 85-A13 (1987)
- Were the Lyman- α Clouds Formed from Shocks? *Ethan T. Vishniac and Gary S. Burt.* **319**, 14, 93-B7 (1987)
- Spartan 1 X-Ray Observations of the Perseus Cluster: Comparison of the Iron Abundances and Temperatures in the Inner and Outer Regions of the Cluster. *M. P. Ulmer, R. G. Craddock, E. E. Fenimore, G. G. Fritz, and W. A. Snyder.* **319**, 118, 94-C11 (1987)
- High-Redshift QSO Absorbing Clouds and the Background Ionizing Source. *R. F. Carswell, J. K. Webb, J. A. Baldwin, and B. Atwood.* **319**, 709, 102-F13 (1987)
- 21 Centimeter Study of Spiral Galaxies in the Coma Supercluster. *Giuseppe Gavazzi.* **320**, 96, 109-B3 (1987)
- The Distribution of QSO Absorption System Column Densities: Evidence for a Single Population. *David Tytler.* **321**, 49, 122-F6 (1987)
- The Redshift Distribution of QSO Lyman-Alpha Absorption Systems. *David Tytler.* **321**, 69, 122-G12 (1987)
- Cosmological H II Regions and the Photoionization of the Intergalactic Medium. *Paul R. Shapiro and Mark L. Giroux.* **321**, L107, 137-A13 (1987)
- Absorption in the Wide QSO Pair Tololo 1037 - 2704 and Tololo 1038 - 2712: Evidence for a Specially Aligned Supercluster at $z = 2$? *Wallace L. W. Sargent and Charles C. Steidel.* **322**, 142, 139-D11 (1987)
- Reionization and Small-Scale Fluctuations in the Microwave Background. *Ethan T. Vishniac.* **322**, 597, 146-C13 (1987)
- On the Origin of Dwarf Galaxies. *Joseph Silk, Rosemary F. G. Wyse, and G. A. Shields.* **322**, L59, 152-A9 (1987)
- On the Origin of Possible Deviation from the Blackbody Spectrum of the Cosmic Microwave Background Radiation: Inverse Compton Hypothesis Based upon the Explosion Scenario. *Satoshi Yoshioka and Satoru Ikeuchi.* **323**, L7, 158-A10 (1987)
- Can Quasars Ionize the Intergalactic Medium? *Megan Donahue and J. Michael Shull.* **323**, L13, 158-B1 (1987)
- High-Resolution Spectra of 24 Low-Redshift QSOs: The Properties of Mg II Absorption Systems. *David Tytler, A. Boksenberg, Wallace L. W. Sargent, Peter Young, and Daniel Kunth.* **324**, 667, 27-B8 (1987) (Abstr. in **318**, 945, 91-C10)
- Galaxies: Internal Motions**
- Shells and Dark Matter in Elliptical Galaxies. *Lars Hernquist and P. J. Quinn.* **312**, 1, 1-A7 (1987)
- Shell Galaxies and Alternatives to the Dark Matter Hypothesis. *Lars Hernquist and P. J. Quinn.* **312**, 17, 1-B9 (1987)
- Gas Clouds in Galactic Bulges. *William G. Mathews and Stephen D. Murray.* **312**, 66, 1-F12 (1987)
- Ultra-High Energy Cosmic Rays in a Galactic Wind and Its Termination Shock. *J. R. Jokipii and G. Morfill.* **312**, 170, 2-G5 (1987)
- Weak Disks in Rapidly Rotating Elliptical Galaxies. *D. Carter.* **312**, 514, 8-E2 (1987)
- Non-Newtonian Forces and the Invisible Mass Problem. *J. R. Kuhn and L. Kruglyak.* **313**, 1, 15-A7 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies. I. New Distance Estimator. *Alan Dressler, Donald Lynden-Bell, David Burstein, Roger L. Davies, S. M. Faber, Roberto Terlevich, and Gary Wegner.* **313**, 42, 15-D7 (1987)
- Fundamental Properties of Elliptical Galaxies. *S. Djorgovski and Marc Davis.* **313**, 59, 15-E14 (1987)
- NGC 5266: An Elliptical Galaxy with a Dust Ring. *S. R. Varnas, F. Bertola, G. Galletta, K. C. Freeman, and D. Carter.* **313**, 69, 15-F12 (1987)
- The Role of Orbital Dynamics and Cloud-Cloud Collisions in the Formation of Giant Molecular Clouds in Global Spiral Structures. *William W. Roberts, Jr. and Glen R. Stewart.* **314**, 10, 28-B4 (1987)
- A Variational Principle for Determining the Oscillations and Stability of Stellar Systems. *John Everson.* **314**, 47, 28-E1 (1987)
- The H I Distribution and Kinematics in Four Low-Luminosity Elliptical Galaxies. *George Lake, R. A. Schommer, and J. H. van Gorkom.* **314**, 57, 28-E12 (1987)
- The Shape of the Dark Halo in Polar-Ring Galaxies. *Bradley C. Whitmore, Douglas B. McElroy, and François Schweizer.* **314**, 439, 34-C9 (1987)
- Triaxial Scale-free Models of Highly Flattened Elliptical Galaxies with and without Massive Halos. *Harold F. Levison and Douglas O. Richstone.* **314**, 476, 34-F9 (1987)
- The Leo Triplet Spiral Galaxy NGC 3628. I. VLA Observations of the Neutral Hydrogen Absorption. *J. T. Schmelz, W. A. Baan, and A. D. Haschick.* **315**, 492, 46-B3 (1987)
- The Evolution of Active Galactic Nuclei. II. Models with Stellar Evolution. *Laurence P. David, Richard H. Durisen, and Haldan N. Cohn.* **316**, 505, 57-E4 (1987)
- Gasdynamical Stripping of Elliptical Galaxies. *T. J. Gaetz, E. E. Salpeter, and G. Shaviv.* **316**, 530, 57-G3 (1987)
- Evidence for a Central Massive Component in Late-Type Spirals. *Vera C. Rubin and J. A. Graham.* **316**, L67, 62-B12 (1987)
- The $Dn-\alpha$ Relation for Bulges of Disk Galaxies: A New, Independent Measure of the Hubble Constant. *Alan Dressler.* **317**, 1, 64-A7 (1987)
- Dynamics of the Outer Disk and Halo of M31. *Richard Nolthenius and Holland C. Ford.* **317**, 62, 64-E13 (1987)
- Metal-enhanced Galactic Winds. II. Radiative Cooling and Pressure Effects. *J. Patricia Vader.* **317**, 128, 65-C14 (1987)
- Nonuniqueness of Self-consistent Equilibrium Solutions for the Perfect Elliptic Disk. *P. T. de Zeeuw, C. Hunter, and M. Schwarzschild.* **317**, 607, 72-F11 (1987)
- Radial Velocities of Late-Type Stars in the Galactic Center. *K. Seligren, D. N. B. Hall, S. G. Kleinmann, and N. Z. Scoville.* **317**, 881, 75-F5 (1987)
- Blueward Asymmetrical Emission-Line Profiles of a Starburst-Nucleus Galaxy Markarian 52. *Yoshiaki Taniguchi.* **317**, L57, 78-B6 (1987)
- Galaxy Formation by Gravitational Collapse. *Barbara S. Ryden and James E. Gunn.* **318**, 15, 79-B5 (1987)
- Models of Ring Galaxies. I. The Growth and Disruption of Clouds in the Expanding Density Wave. *P. N. Appleton and Curtis Struck-Marcell.* **318**, 103, 80-A14 (1987)
- The 18 Centimeter OH Emission of IC 4553 (Arp 220). *Willem A. Baan and Aubrey D. Haschick.* **318**, 139, 80-D10 (1987)
- Detection of Retrograde Gas Streaming in the SB0 Galaxy NGC 4546. *G. Galletta.* **318**, 531, 86-F3 (1987)
- Nonlinear Coupling of Galactic Spiral Modes. *M. Tagger, J. F. Sygnet, E. Athanassoula, and R. Pellat.* **318**, L43, 92-B4 (1987)
- Kinematics and Ionization of Extended Gas in Active Galaxies. III. The Extranuclear Properties of NGC 1068. *J. A. Baldwin, A. S. Wilson, and Mark Whittle.* **319**, 84, 94-A3 (1987)
- Angular Momentum from Tidal Torques. *Joshua Barnes and George Efsthathiou.* **319**, 575, 101-C1 (1987)
- Formation of Stellar Shells and X-Ray Coronae around Elliptical Galaxies. *Masayuki Umemura and Satoru Ikeuchi.* **319**, 601, 101-E5 (1987)
- Evolution of Hot Galactic Flows. *Michael Loewenstein and William G. Mathews.* **319**, 614, 101-F4 (1987)
- Steady State Cooling Flow Models for Normal Elliptical Galaxies. *Craig L. Sarazin and Raymond E. White III.* **320**, 32, 108-C11 (1987)
- The Broad-Line Region at the Center of the Galaxy. *T. R. Geballe, R. Wade, K. Krisciunas, I. Gatley, and M. C. Bird.* **320**, 562, 115-F12 (1987)
- Self-consistent Models of Perfect Triaxial Galaxies. *Thomas S. Statler.* **321**, 113, 123-D1 (1987)
- Axisymmetric Shell Models with Stäckel Potentials. *Jeffrey L. Bishop.* **322**, 618, 146-E7 (1987)
- A Central Black Hole in M32. *John L. Tonry.* **322**, 932, 146-F7 (1987)
- The Luminosity-Velocity Diagram: A New Distance Estimator for Spiral Galaxies? *Barry F. Madore and David Woods.* **323**, L25, 158-B13 (1987)
- H I Survey of Face-on Galaxies: The Frequency of Distortions in H I Disks. *B. M. Lewis.* **323**, 515, 9-A5 (1987) (Abstr. in **313**, 928, 26-G11)
- The Structure and Dynamics of Ringed Galaxies. III. Surface Photometry and Kinematics of the Ringed Nonbarred Spiral NGC 7531. *R. Buta.* **324**, 1, 17-A5 (1987) (Abstr. in **315**, 730, 48-E11)
- The Structure and Dynamics of Ringed Galaxies. IV. Surface Photometry and Kinematics of the Ringed Barred Spiral NGC 6300. *R. Buta.* **324**, 383, 22-A5 (1987) (Abstr. in **316**, 859, 61-E1)
- Spectroscopy and Photometry of Elliptical Galaxies. II. The Spectroscopic Parameters. *Roger L. Davies, David Burstein, Alan Dressler, S. M. Faber, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner.* **324**, 581, 26-B1 (1987) (Abstr. in **318**, 944, 91-C9)
- Galaxies: Interstellar Matter**
- Two Micron Spectroscopy of IRAS Galaxies. *Kimiaki Kawara, Minoru Nishida, and Brooke Gregory.* **321**, L35, 129-D12 (1987)
- Giant Molecular Clouds in M31. *S. N. Vogel, F. Boulanger, and R. Ball.* **321**, L145, 137-D8 (1987)
- Galaxies: Jets**
- X-Rays from the Radio Halo of M87. *E. D. Feigelson, P. A. D. Wood,*

- E. J. Schreier, D. E. Harris, and M. J. Reid. **312**, 101, 2-B5 (1987)
 Structure in the Nucleus of NGC 1068 at 10 Microns. R. Tresch-Fienberg, G. G. Fazio, D. Y. Gezari, W. F. Hoffmann, G. M. Lamb, P. K. Shu, and C. R. McCreight. **312**, 542, 8-G2 (1987)
 X-Ray Emission Associated with the Jet in 3C 273. D. E. Harris and C. P. Stern. **313**, 136, 16-D14 (1987)
 Magnetic Fields in Extragalactic Jets. William K. Rose. **313**, 146, 16-E10 (1987)
 Spatial Stability of Jets: The Nonaxisymmetric Fundamental and Reflection Modes. Philip E. Hardee. **313**, 607, 23-D6 (1987)
 Beam Models for Radio Sources. VI. Evolution of Magnetized Jets in Power-Law Potentials. M. Javad Siah and Paul J. Wiita. **313**, 623, 23-E8 (1987)
 Jet Collimation by Turbulent Viscosity. I. R. N. Henriksen. **314**, 33, 28-D1 (1987)
 Radiation from Relativistic Beams Interacting with Interstellar Gas. W. K. Rose, J. H. Beall, J. Guillory, and S. Kainer. **314**, 95, 29-A12 (1987)
 Hydrostatic Confinement of Radio Jets. Kayll Lake and Patrick Boucher. **314**, 507, 34-B2 (1987)
 Multiphase VLB1 Observations of 4C 39.25: Superluminal Motion and Stationary Structure. David B. Shaffer, Alan P. Marscher, Jon Maricade, and Jonathan D. Romney. **314**, L1, 33-B4 (1987)
 Self-collimated Electromagnetic Jets from Magnetized Accretion Disks. R. V. E. Lovelace, J. C. L. Wang, and M. E. Sulkanen. **315**, 504, 46-C1 (1987)
 Numerical Simulations of Adiabatic Axisymmetric Accretion Flow. I. A New Mechanism for the Formation of Jets. B. A. Fryxell, Ronald E. Taam, and S. L. W. McMillan. **315**, 536, 46-E5 (1987)
 Evolution of 3C 273 at 10.7 GHz. M. H. Cohen, J. A. Zensus, J. A. Biretta, G. Comoretto, P. Kaufmann, and Z. Abraham. **315**, L89, 49-B11 (1987)
 Astrophysical Implications of the Multifrequency VLA Observations of NGC 1265. Christopher P. O'Dea and Frazer N. Owen. **316**, 95, 51-A11 (1987)
 The Radio Morphology of 3C 120 on Scales from 0.5 Parsecs to 400 Kiloparsecs. R. C. Walker, J. M. Benson, and S. C. Unwin. **316**, 546, 58-A5 (1987)
 VLB1 Observations of the 3C 111 Jet. Roger Linfield. **317**, 121, 65-C7 (1987)
 On Magnetohydrodynamic Solitons in Jets. B. Roberts. **318**, 590, 87-D1 (1987)
 Multifrequency VLB1 Observations of 4C 39.25: A Superluminal Source without a Well-defined Core. Alan P. Marscher, David B. Shaffer, Roy S. Booth, and Barry J. Geldzahler. **319**, L69, 107-D7 (1987)
 A Shocked-Jet Model of the Galactic Center Bridge and the Radio Arc. Yoshiaki Sofue and Mitsuaki Fujimoto. **319**, L73, 107-D11 (1987)
 Electromagnetic Jets from Compact Objects. F. Curtis Michel. **321**, 714, 132-C13 (1987)
 Superluminal Motion in the Double-lobed Quasar 3C 245. D. H. Hough and A. C. S. Readhead. **321**, L11, 129-C1 (1987)
 A Correlation between the Radio and Optical Morphologies of Distant 3CR Radio Galaxies. Patrick J. McCarthy, Wil van Breugel, Hyron Spinrad, and S. Djorgovski. **321**, L29, 129-D3 (1987)
 VLB1 Structure of 3C 84 at 89 GHz. D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman. **322**, 74, 138-F11 (1987)
 Inverse Compton Scattering of Ambient Radiation by a Cold Relativistic Jet: A Source of Beamed, Polarized Continuum in Blazars? Mitchell C. Begelman and Marek Sikora. **322**, 650, 146-G12 (1987)
Galaxies: Local Group
 The Redshift-Distance Relation. IXa. Reinterpretation of the Local Group Deceleration Data Emphasizing the Kahn-Woltjer Mass Determination. Allan Sandage. **317**, 557, 72-C1 (1987)
Galaxies: Magellanic Clouds
 CO Band Synthesis and the Interpretation of Band Strengths in Magellanic Cloud Supergiants. Peter J. McGregor. **312**, 195, 3-B2 (1987)
 The Wolf-Rayet Population in 30 Doradus and Its Surroundings. Anthony F. J. Moffat, Virpi S. Niemela, M. M. Phillips, You-hua Chu, and Wilhelm Seggewiss. **312**, 612, 9-E7 (1987)
 A 9 Month Long Soft X-Ray Survey of the Large Magellanic Cloud. I. X-Ray Map at $\frac{1}{4}$ keV. K. P. Singh, J. A. Nousek, D. N. Burrows, and G. P. Garmire. **313**, 185, 17-A7 (1987)
 Intermediate-Age Core Helium Burning Stars and the Distance to the Magellanic Clouds. E. Seidel, G. S. Da Costa, and Pierre Demarque. **313**, 192, 17-B1 (1987)
 X-Ray Studies of the Supernova Remnant N132D. I. Morphology. John P. Hughes. **314**, 103, 29-B6 (1987)
 Optical Color, Polarimetric, and Timing Measurements of the 50 Millisecond Large Magellanic Cloud Pulsar, PSR 0540 - 69. J. Middleditch, C. R. Pennypacker, and M. S. Burns. **315**, 142, 41-E8 (1987)
 Main-Sequence CCD Photometry of the Globular Cluster NGC 362. Michael Bolte. **315**, 469, 45-G6 (1987)
 New Evolutionary Relationships for Magellanic Cloud Planetary Nebulae. Michael A. Dopita, Stephen J. Meatheringham, Peter R. Wood, B. Louise Webster, David H. Morgan, and Holland C. Ford. **315**, L107, 49-D2 (1987)
 Deep Einstein X-Ray Imagery of the Small Magellanic Cloud. Frederick C. Bruhweiler, Daniel A. Klingensmith III, Theodore R. Gull, and Sabatino Sofia. **317**, 152, 65-E11 (1987)
 On the Chemical Homogeneity of the 30 Doradus H II Region and a Local Enrichment by Wolf-Rayet Stars. Michael Rosa and John S. Mathis. **317**, 163, 65-F11 (1987)
 Spectroscopy and JHK Photometry of Type II Cepheids in the Magellanic Clouds. Douglas L. Welch. **317**, 672, 73-D6 (1987)
 IRAS Observations of Collisionally Heated Dust in Large Magellanic Cloud Supernova Remnants. James R. Graham, A. Evans, J. S. Albinson, M. F. Bode, and W. P. S. Meikle. **319**, 126, 94-D5 (1987)
 Physical Parameters for 12 Planetary Nebulae and Their Central Stars in the Magellanic Clouds. Lawrence H. Aller, Charles D. Keyes, Stephen P. Maran, Theodore R. Gull, Andrew G. Michalitsianos, and Theodore P. Stecher. **320**, 159, 109-F12 (1987)
 Angular Diameters and Fluxes of Magellanic Cloud Planetary Nebulae. II. High-Speed Direct Imaging. P. R. Wood, S. J. Meatheringham, M. A. Dopita, and D. H. Morgan. **320**, 178, 110-A11 (1987)
 Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storchi-Bergmann, and J. Matthews. **320**, 589, 116-B3 (1987)
 The Interstellar Medium toward Supernova 1987A. A. K. Dupree, R. P. Kirshner, G. E. Nassiopoulou, J. C. Raymond, and G. Sonneborn. **320**, 597, 116-B11 (1987)
 Ultraviolet Observations of SN 1987A. Robert P. Kirshner, George Sonneborn, D. Michael Crenshaw, and George E. Nassiopoulou. **320**, 602, 116-C2 (1987)
 Vacuum Ultraviolet Images of the Large Magellanic Cloud. Andrew M. Smith, Robert M. Cornett, and Robert S. Hill. **320**, 609, 116-C9 (1987)
 CCD Photometry of Large Magellanic Cloud Clusters. IV. The Metal-rich, Remote Southern Cluster LW 79. Mario Mateo and Paul Hodge. **320**, 626, 116-D14 (1987)
 The Evolution of Asymptotic Giant Branch Stars in the Magellanic Clouds. III. The Problem of Intermediate-Mass Stars. Jeremy Mould and Neil Reid. **321**, 156, 124-A1 (1987)
 Distance Moduli and Structure of the Magellanic Clouds from Near-Infrared Photometry of Classical Cepheids. Douglas L. Welch, Robert A. McLaren, Barry F. Madore, and Christopher W. McAlary. **321**, 162, 124-A7 (1987)
 The Age of the Large Magellanic Cloud Cluster NGC 2193. G. S. Da Costa, Christopher R. King, and J. R. Mould. **321**, 735, 132-E6 (1987)
 CAL 83: A Puzzling X-Ray Source in the Large Magellanic Cloud. David Crampton, A. P. Cowley, J. B. Hutchings, Paul C. Schmidtke, I. B. Thompson, and James Liebert. **321**, 745, 132-F3 (1987)
 X-Ray Observations of the Supernova Remnant N103B in the Large Magellanic Cloud. K. P. Singh, N. J. Westergaard, H. W. Schnopper, and D. J. Helfand. **322**, 80, 138-G3 (1987)
 A Preliminary Survey of Collapsed Cores in the Magellanic Clouds' Globular Clusters. G. Meylan and S. Djorgovski. **322**, L91, 152-C10 (1987)
 The Structure of Young Star Clusters in the Large Magellanic Cloud. Rebecca A. W. Elson, S. Michael Fall, and Kenneth C. Freeman. **323**, 54, 153-F1 (1987)
 The Stellar Populations of Shapley Constellation III. Neill Reid, Jeremy Mould, and Ian Thompson. **323**, 433, 159-C11 (1987)
 Collapsed Cores and the Structural Parameters of Old Large Magellanic Cloud Star Clusters. Mario Mateo. **323**, L41, 158-C12 (1987)
 Ultraviolet Observations by the IUE of 31 Clusters of the Large Magellanic Cloud. A. Cassatella, J. Barbero, and E. H. Geyer. **64**, 83, 18-A7 (1987) (Abstr. in **314**, 832, 38-F8)
Galaxies: Nuclei
 X-Rays from the Radio Halo of M87. E. D. Feigelson, P. A. D. Wood, E. J. Schreier, D. E. Harris, and M. J. Reid. **312**, 101, 2-B5 (1987)
 A Statistical Analysis of the Einstein Normal Galaxy Sample. III. Radio and X-Ray Properties of Elliptical and S0 Galaxies. G. Fabbiano, U. Klein, G. Trinchieri, and R. Wielebinski. **312**, 111, 2-C1 (1987)
 Infrared Characteristics of the Nuclei of Normal Galaxies. Nicholas A. Devereux, E. E. Becklin, and Nick Scoville. **312**, 529, 8-F3 (1987)
 Structure in the Nucleus of NGC 1068 at 10 Microns. R. Tresch-Fienberg, G. G. Fazio, D. Y. Gezari, W. F. Hoffmann, G. M. Lamb, P. K.

Galaxies: Nuclei—Continued

- Shu, and C. R. McCreight. **312**, 542, 8-G2 (1987)
- Molecular Gas in the Starburst Nucleus of M82. K. Y. Lo, K. W. Cheung, C. R. Masson, T. G. Phillips, S. L. Scott, and D. P. Woody. **312**, 574, 9-B7 (1987)
- IRAS Large-Beam and Ground-Based Small-Beam Measurements of the Unidentified 11.3 and [Ne II] 12.8 Micron Line Fluxes in the Starburst Galaxy M82. P. D. LeVan and S. D. Price. **312**, 592, 9-D1 (1987)
- The Molecular Cloud Ring in NGC 1068. Steven T. Myers and N. Z. Scoville. **312**, L39, 14-B6 (1987)
- Magnetic Fields in Extragalactic Jets. William K. Rose. **313**, 146, 16-E10 (1987)
- Dynamical Heating of Stars as a Fueling Mechanism for Active Galactic Nuclei. A. J. Allen and P. A. Hughes. **313**, 152, 16-F2 (1987)
- The Origin of the Photoionizing Continuum of Active Galactic Nuclei and Quasars. S. L. O'Dell, H. A. Scott, and W. A. Stein. **313**, 164, 16-F14 (1987)
- The Evolution of Active Galactic Nuclei. I. Models without Stellar Evolution. Laurence P. David, Richard H. Durisen, and Haldan N. Cohn. **313**, 556, 22-G9 (1987)
- Recombination Spectroscopy of Star-Formation Regions in the Nucleus of M83. Jean L. Turner, Paul T. P. Ho, and Sara C. Beck. **313**, 644, 23-G2 (1987)
- IRAS 00521 – 7054: An Unusually Warm Galaxy. Jay A. Frogel and J. H. Elias. **313**, L53, 27-B10 (1987)
- Electromagnetic Cascades in the Magnetosphere of a Very Young Pulsar: A Model for the Positron Production near the Galactic Center. Apostolos Mastichiadis, Kenneth Brecher, and Alan P. Marscher. **314**, 88, 29-A5 (1987)
- Radiation from Relativistic Beams Interacting with Interstellar Gas. W. K. Rose, J. H. Beall, J. Guillery, and S. Kainer. **314**, 95, 29-A12 (1987)
- Molecular Gas Within 2° of the Galactic Center. I. Survey of ^{13}CO Emission. Gary M. Heiligman. **314**, 747, 37-G1 (1987)
- Far-Infrared Spectroscopy of Star Formation Regions in M82. P. B. Duffy, E. F. Erickson, M. R. Haas, and J. R. Houck. **315**, 68, 40-F6 (1987)
- The Continuum of Type I Seyfert Galaxies. I. A Single Form Modified by the Effects of Dust. Martin Ward, Martin Elvis, G. Fabbiano, N. P. Carleton, S. P. Willner, and A. Lawrence. **315**, 74, 40-F12 (1987)
- Deconvolution of Elliptical Nuclei of Galaxies: Application to M81: Erratum. O. Bendinelli, G. Parmeggiani, and T. Zavatti. **315**, 408, 44-C14 (1987) (Orig. paper in **308**, 611, 115-E14)
- The Reddening of Cygnus A from a Measurement of Paschen-Alpha. S. J. Lilly and G. J. Hill. **315**, L103, 49-C12 (1987)
- Effects of Electron-Positron Pair Opacity for Spherical Accretion onto Black Holes. Alan P. Lightman, Andrzej A. Zdziarski, and Martin J. Rees. **315**, L113, 49-D8 (1987)
- The Evolution of Active Galactic Nuclei. II. Models with Stellar Evolution. Laurence P. David, Richard H. Durisen, and Haldan N. Cohn. **316**, 505, 57-E4 (1987)
- Broad, Variable Absorption Lines in the Seyfert Galaxy NGC 3516: Probing the Structure of the Emission-Line Regions. G. Mark Voit, J. Michael Shull, and Mitchell C. Begelman. **316**, 573, 58-C5 (1987)
- 92 Centimeter VLBI Structure of the Elliptical Galaxy MCG 5-4-18: Erratum. J. M. Wrobel and R. S. Simon. **316**, 858, 61-D14 (1987) (Orig. paper in **309**, 593, 127-F6)
- IRAS 23060 + 0505: A Highly Obscured $3.3 \times 10^{12} L_{\odot}$ Active Galaxy. G. J. Hill, C. G. Wynn-Williams, and E. E. Becklin. **316**, L11, 56-A14 (1987)
- Discovery of Broad Brackett- α Emission in Arp 220. D. L. DePoy, E. E. Becklin, and T. R. Geballe. **316**, L63, 62-B8 (1987)
- Evidence for a Central Massive Component in Late-Type Spirals. Vera C. Rubin and J. A. Graham. **316**, L67, 62-B12 (1987)
- Star Formation in the Magellanic Irregular Galaxy NGC 4449. Harley A. Thronson, Jr., Deidre A. Hunter, C. M. Telesco, D. A. Harper, and R. Decher. **317**, 180, 66-A3 (1987)
- A New Constraint on the Galactic Plane ^{26}Al Distribution. C. J. MacCullum, A. F. Hutters, P. D. Stang, and M. Leventhal. **317**, 877, 75-F1 (1987)
- Radial Velocities of Late-Type Stars in the Galactic Center. K. Seligren, D. N. B. Hall, S. G. Kleinmann, and N. Z. Scoville. **317**, 881, 75-F5 (1987)
- Blueward Asymmetrical Emission-Line Profiles of a Starburst-Nucleus Galaxy Markarian 52. Yoshiaki Taniguchi. **317**, L57, 78-B6 (1987)
- The Origin of the Diffuse X-Ray Background. T. T. Hamilton and D. J. Helfand. **318**, 93, 80-A1 (1987)
- Aperture Synthesis Observations of the Circumnuclear Ring in the Galactic Center. R. Güsten, R. Genzel, M. C. H. Wright, D. T. Jaffe, J. Stutzki, and A. I. Harris. **318**, 124, 80-C8 (1987)
- The 18 Centimeter OH Emission of IC 4553 (Arp 220). Willem A. Baan and Aubrey D. Haschick. **318**, 139, 80-D10 (1987)
- Observations of 1.3 Millimeter Emission from the Centers of Galaxies. Harley A. Thronson, Jr., Christopher K. Walker, Constance E. Walker, and Philip Maloney. **318**, 645, 88-A4 (1987)
- Map of the Galactic Center Region in the 1.8 MeV ^{26}Al Gamma-Ray Line. P. von Ballmoos, R. Diehl, and V. Schönfelder. **318**, 654, 88-B1 (1987)
- Photoerosion of Nuclei in Quasar Emission-Line Regions. R. N. Boyd and G. J. Ferland. **318**, L21, 85-B8 (1987)
- Kinematics and Ionization of Extended Gas in Active Galaxies. III. The Extranuclear Properties of NGC 1068. J. A. Baldwin, A. S. Wilson, and Mark Whittle. **319**, 84, 94-A3 (1987)
- A Radiative Bow Shock Wave (?) Driven by Nuclear Ejecta in a Seyfert Galaxy. Andrew S. Wilson and James S. Ulvestad. **319**, 105, 94-B11 (1987)
- Galactic Center Positronium Fraction: Observations and Simulations. B. L. Brown and M. Leventhal. **319**, 637, 102-A1 (1987)
- A Shocked-Jet Model of the Galactic Center Bridge and the Radio Arc. Yoshiaki Sofue and Mitsuaki Fujimoto. **319**, L73, 107-D11 (1987)
- Global Properties of Interacting Disk-Type Galaxies. Howard A. Bushouse. **320**, 49, 108-E4 (1987)
- How Big Are Supermassive Black Holes Formed from the Collapse of Dense Star Clusters? Christopher S. Kochanek, Stuart L. Shapiro, and Saul A. Teukolsky. **320**, 73, 108-G8 (1987)
- The Velocity Distribution of Quasar/AGN Broad Emission Line Clouds. R. C. Puetter and E. N. Hubbard. **320**, 85, 109-A6 (1987)
- Hot Dust and the Near-Infrared Bump in the Continuum Spectra of Quasars and Active Galactic Nuclei. Richard Barvainis. **320**, 537, 115-D4 (1987)
- Structural Details of the Sagittarius A Complex: Evidence for a Large-Scale Poloidal Magnetic Field in the Galactic Center Region. F. Yusef-Zadeh and M. Morris. **320**, 545, 115-D12 (1987)
- The Broad-Line Region at the Center of the Galaxy. T. R. Geballe, R. Wade, K. Krisciunas, I. Gatley, and M. C. Bird. **320**, 562, 115-F12 (1987)
- Ionization State in and Reddening to the Center of the Galaxy. R. Wade, T. R. Geballe, K. Krisciunas, I. Gatley, and M. C. Bird. **320**, 570, 115-G7 (1987)
- H₂O Maser Emission from the Nuclei of NGC 253 and M51. Paul T. P. Ho, Robert N. Martin, Christian Henkel, and Jean L. Turner. **320**, 663, 117-A12 (1987)
- A Nonthermal Model for the XUV, Soft X-Ray Emission of AGN and QSOs. T. W. Jones and W. A. Stein. **320**, L1, 114-A4 (1987)
- Fe K Features as Probes of the Nuclear Reflection Region in Seyfert Galaxies. Julian H. Krolik and Timothy R. Kallman. **320**, L5, 114-A8 (1987)
- The Fading of the Narrow-Line Region in 3C 390.3. J. Clavel and W. Wamsteker. **320**, L9, 114-A12 (1987)
- Electron Injection by Relativistic Protons in Active Galactic Nuclei. Marek Sikora, John G. Kirk, Mitchell C. Begelman, and Peter Schneider. **320**, L81, 121-B1 (1987)
- On Nonthermal Models for Active Galactic Nuclei. David L. Band. **321**, 80, 123-A9 (1987)
- Relativistic Thermal Plasmas: Time Development of Electron-Positron Pair Concentration. Masaaki Kusunose. **321**, 186, 124-C3 (1987)
- The Collapse of Dense Star Clusters to Supermassive Black Holes: Binaries and Gravitational Radiation. Gerald D. Quinlan and Stuart L. Shapiro. **321**, 199, 124-D2 (1987)
- The Host Galaxy of Markarian 231. Donald Hamilton and William C. Keel. **321**, 211, 124-E1 (1987)
- Electromagnetic Jets from Compact Objects. F. Curtis Michel. **321**, 714, 132-C13 (1987)
- The Production of ^{26}Al in Supermassive Stars and the Gamma-Ray Line Flux from the Galactic Center. Wolfgang Hillebrandt, Friedrich-Karl Thielemann, and Norbert Langer. **321**, 761, 132-G7 (1987)
- Two Micron Spectroscopy of IRAS Galaxies. Kimiaki Kawara, Minoru Nishida, and Brooke Gregory. **321**, L35, 129-D12 (1987)
- Synchrotron Emission from Shock Waves in Active Galactic Nuclei. P. L. Biermann and P. A. Strittmatter. **322**, 643, 146-G5 (1987)
- Inverse Compton Scattering of Ambient Radiation by a Cold Relativistic Jet: A Source of Beamed, Polarized Continuum in Blazars? Mitchell C. Begelman and Marek Sikora. **322**, 650, 146-G12 (1987)
- The Linear Filaments of the Radio Arc near the Galactic Center. Farhad Yusef-Zadeh and Mark Morris. **322**, 721, 147-F7 (1987)
- Constraints on Possible Precursor AGN Sources of the Cosmic X-Ray Background. Elihu Boldt and Darryl Leiter. **322**, L1, 145-A4 (1987)
- Hot Gas in the Nucleus of IC 342: Detection of $J = 3-2$ CO Emission. Paul T. P. Ho, Jean L. Turner, and Robert N. Martin. **322**, L67, 152-B3 (1987)

- The Spatial Distribution of 10 Micron Luminosity in Spiral Galaxies. *Nicholas Devereux*. **323**, 91, 154-B1 (1987)
- Pair-Creation Effects in Accretion Shock Models of Active Galactic Nuclei. *John M. Blondin and Arieh Königl*. **323**, 451, 159-E1 (1987)
- What Heats the Hot Phase in Active Nuclei? *William G. Mathews and Gary J. Ferland*. **323**, 456, 159-E6 (1987)
- VLBI Observations of 23 Hot Spots in the Starburst Galaxy M82. *N. Bartel, M. I. Ratner, A. E. E. Rogers, I. I. Shapiro, R. J. Bonometti, N. L. Cohen, M. V. Gorenstein, J. M. Marcaide, and R. A. Preston*. **323**, 505, 160-B3 (1987)
- Far-Infrared Variability in Active Galactic Nuclei. *R. A. Edelson and M. A. Malkan*. **323**, 516, 160-B14 (1987)
- Positron Annihilation at the Galactic Center. *B. J. Carrigan and J. I. Katz*. **323**, 557, 160-G23 (1987)
- Far-Infrared Luminosities of Markarian Starburst Galaxies. II. Individual Galaxies. *L. K. Deutsch and S. P. Willner*. **63**, 803, 13-E14 (1987) (Abstr. in **314**, 831, 38-F7)
- Galactic Center Molecular Clouds. I. Spatial and Spatial-Velocity Maps. *John Bally, Antony A. Stark, Robert W. Wilson, and Christian Henkel*. **65**, 13, 28-B2 (1987) (Abstr. in **319**, 1011, 106-A9)
- Galaxies: Photometry**
- Detection of the Lensing Galaxy in PG 1115 + 080. *C. A. Christian, D. Crabtree, and P. Waddell*. **312**, 45, 1-D10 (1987)
- Weak Disks in Rapidly Rotating Elliptical Galaxies. *D. Carter*. **312**, 514, 8-E2 (1987)
- Infrared Characteristics of the Nuclei of Normal Galaxies. *Nicholas A. Devereux, E. E. Becklin, and Nick Scoville*. **312**, 529, 8-F3 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies. I. New Distance Estimator. *Alan Dressler, Donald Lynden-Bell, David Burstein, Roger L. Davies, S. M. Faber, Roberto Terlevich, and Gary Wegner*. **313**, 42, 15-D7 (1987)
- Fundamental Properties of Elliptical Galaxies. *S. Djorgovski and Marc Davis*. **313**, 59, 15-E14 (1987)
- NGC 5266: An Elliptical Galaxy with a Dust Ring. *S. R. Varnas, F. Bertola, G. Galletta, K. C. Freeman, and D. Carter*. **313**, 69, 15-F12 (1987)
- NGC 3928: A Highly Bulge-dominated Compact Spiral Galaxy. *Yoshiaki Taniguchi and Masaaki Watanabe*. **313**, 89, 16-A5 (1987)
- Sources of Error in the Tully-Fisher Relation: Reducing the Scatter with CCD *r*-Band Surface Photometry of Spiral Galaxies. *Gregory D. Bothun and Jeremy R. Mould*. **313**, 629, 23-F1 (1987)
- The H I Distribution and Kinematics in Four Low-Luminosity Elliptical Galaxies. *George Lake, R. A. Schommer, and J. H. van Gorkom*. **314**, 57, 28-E12 (1987)
- The Shape of the Dark Halo in Polar-Ring Galaxies. *Bradley C. Whitmore, Douglas B. McElroy, and François Schweizer*. **314**, 439, 34-C9 (1987)
- On the Origin of the 40–120 Micron Emission of Galaxy Disks: A Comparison with H α Fluxes. *Carol J. Lonsdale Persson and George Helou*. **314**, 513, 35-B8 (1987)
- Deconvolution of Elliptical Nuclei of Galaxies: Application to M81: Erratum. *O. Bendielli, G. Parmeggiani, and T. Zavatti*. **315**, 408, 44-C14 (1987) (Orig. paper in **308**, 611, 115-E14)
- Color Evolution in High-Redshift Galaxies. *Peter R. M. Eisenhardt and M. J. Lebofsky*. **316**, 70, 50-F14 (1987)
- Star Formation in the Magellanic Irregular Galaxy NGC 4449. *Harley A. Thronson, Jr., Deidre A. Hunter, C. M. Telesco, D. A. Harper, and R. Decher*. **317**, 180, 66-A3 (1987)
- The Extragalactic Background Light and a Definitive Resolution of Olbers's Paradox. *Paul S. Wesson, K. Valle, and R. Stabell*. **317**, 601, 72-F5 (1987)
- Dust Distribution in Spiral Galaxies. *Nikolaos D. Kylafis and John N. Bahcall*. **317**, 637, 73-A13 (1987)
- Alignment Statistics of Clusters with Their Brightest Members at Bright and Faint Isophotes. *Mitchell F. Struble*. **317**, 668, 73-D2 (1987)
- A Study of a Flux-limited Sample of IRAS Galaxies. *Beverly J. Smith, S. G. Kleinmann, J. P. Huchra, and F. J. Low*. **318**, 161, 80-F5 (1987)
- Isophotal Diameters of Galaxies at High Redshifts. *Daniel W. Weedman and Karen L. Williams*. **318**, 565, 87-C10 (1987)
- The Red/Infrared Evolution in Galaxies—Effects of the Stars on the Asymptotic Giant Branch. *Arati Chokshi and Edward L. Wright*. **319**, 44, 93-E1 (1987)
- Infrared Emission and Star Formation in Early-Type Galaxies. *Harley A. Thronson, Jr. and John Bally*. **319**, L63, 107-D1 (1987)
- Global Properties of Interacting Disk-Type Galaxies. *Howard A. Bushouse*. **320**, 49, 108-E4 (1987)
- What Is the Difference between Radio Galaxies and Radio Quasar Galaxies? *J. B. Hutchings*. **320**, 122, 109-D1 (1987)
- The Structure and Evolution of Hoag's Object. *François Schweizer, W. Kent Ford, Jr., Robert Jedrzejewski, and Riccardo Giovanelli*. **320**, 454, 114-D3 (1987)
- The Morphology of the Rich Supercluster 1451 + 22. *Robin Ciardullo*. **321**, 607, 131-C1 (1987)
- Far-Infrared Properties of Cluster Galaxies. *Michael D. Bicay and Riccardo Giovanelli*. **321**, 645, 131-E11 (1987)
- Cosmological Parameters from the IRAS Galaxy Sample. *Jens Verner Villumsen and Michael A. Strauss*. **322**, 37, 138-D1 (1987)
- Arecibo Observations of IRAS Galaxies at 21 and 18 Centimeters Wavelengths. *Robert W. Garwood, George Helou, and John M. Dickey*. **322**, 88, 138-G11 (1987)
- The CO Contents of Dwarf Irregular Galaxies. *Linda J. Tacconi and Judith S. Young*. **322**, 681, 147-C1 (1987)
- The Spatial Distribution of 10 Micron Luminosity in Spiral Galaxies. *Nicholas Devereux*. **323**, 91, 154-B1 (1987)
- Results from a Visual Survey of All 2712 Abell Clusters. *Mitchell F. Struble and Herbert J. Rood*. **323**, 468, 159-F4 (1987)
- Far-Infrared Variability in Active Galactic Nuclei. *R. A. Edelson and M. A. Malkan*. **323**, 516, 160-B14 (1987)
- The Luminosity-Velocity Diagram: A New Distance Estimator for Spiral Galaxies? *Barry F. Madore and David Woods*. **323**, L25, 158-B13 (1987)
- A Very Deep IRAS Survey at $l = 97^\circ$, $b = 30^\circ$. *Perry Hacking and J. R. Houck*. **323**, 311, 5-A3 (1987) (Abstr. in **312**, 965, 13-E6)
- Far-Infrared Luminosities of Markarian Starburst Galaxies. II. Individual Galaxies. *L. K. Deutsch and S. P. Willner*. **63**, 803, 13-E14 (1987) (Abstr. in **314**, 831, 38-F7)
- The Structure and Dynamics of Ringed Galaxies. IV. Surface Photometry and Kinematics of the Ringed Barred Spiral NGC 6300. *R. Buta*. **64**, 383, 22-A5 (1987) (Abstr. in **316**, 859, 61-E1)
- Mass-to-Light Ratios of Binary Galaxies. II. Photoelectric BV Photometry. *Linda Y. Schweizer*. **64**, 417, 22-D9 (1987) (Abstr. in **316**, 860, 61-E2)
- Isophotal Diameters of Cluster Spirals. *M. E. Cornell, M. Aaronson, G. Bothun, and J. Mould*. **64**, 507, 24-A5 (1987) (Abstr. in **317**, 1002, 77-B5)
- Spectroscopy and Photometry of Elliptical Galaxies. II. The Spectroscopic Parameters. *Roger L. Davies, David Burstein, Alan Dressler, S. M. Faber, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner*. **64**, 581, 26-B1 (1987) (Abstr. in **318**, 944, 91-C9)
- Spectroscopy and Photometry of Elliptical Galaxies. III. UBV Aperture Photometry, CCD Photometry, and Magnitude-related Parameters. *David Burstein, Roger L. Davies, Alan Dressler, S. M. Faber, Remington P. S. Stone, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner*. **64**, 601, 26-C7 (1987) (Abstr. in **318**, 944, 91-C9)
- The Structure of Brightest Cluster Members. II. Mergers. *James M. Schombert*. **64**, 643, 26-G2 (1987) (Abstr. in **318**, 945, 91-C10)
- Galaxies: Redshifts**
- Non-Newtonian Forces and the Invisible Mass Problem. *J. R. Kuhn and L. Kruglyak*. **313**, 1, 15-A7 (1987)
- Spectroscopy and Photometry of Elliptical Galaxies: A Large-Scale Streaming Motion in the Local Universe. *Alan Dressler, S. M. Faber, David Burstein, Roger L. Davies, Donald Lynden-Bell, R. J. Terlevich, and Gary Wegner*. **313**, L37, 27-A9 (1987)
- Interpretation of Large-Scale Deviations from the Hubble Flow. *B. Grinstein, H. David Politzer, S.-J. Rey, and Mark B. Wise*. **314**, 431, 34-C1 (1987)
- A Survey of the Bootes Void. *Robert P. Kirshner, Augustus Oemler, Jr., Paul L. Schechter, and Stephen A. Shectman*. **314**, 493, 35-A2 (1987)
- Emission-Line Galaxies in the Bootes Void. *J. Ward Moody, Robert P. Kirshner, Gordon M. MacAlpine, and Stephen A. Gregory*. **314**, L33, 39-A13 (1987)
- X-Ray-Selected AGNs near Bright Galaxies. *John T. Stocke, Peter Schneider, Simon L. Morris, Isabella M. Gioia, Tommaso Maccacaro, and Rudolph E. Schild*. **315**, L11, 45-A14 (1987)
- The Spatial Distribution of Dwarf Galaxies in the CfA Slice of the Universe. *Trinh X. Thuan, J. Richard Gott III, and Stephen E. Schneider*. **315**, L93, 49-C2 (1987)
- The Paucity of High-Redshift Quasars and Comparative Cosmology. *I. E. Segal*. **316**, L5, 56-A8 (1987)
- A Very Deep IRAS Survey: Constraints on the Evolution of Starburst Galaxies. *Perry Hacking, J. J. Condon, and J. R. Houck*. **316**, L15, 56-B4 (1987)
- The Redshift-Distance Relation. IXa. Reinterpretation of the Local Group Deceleration Data Emphasizing the Kahn-Woltjer Mass Determination. *Allan Sandage*. **317**, 557, 72-C1 (1987)
- The Local Extragalactic Velocity Field, the Local Mean Mass Density, and Biased Galaxy Formation. *M. E. Brown and P. J. E. Peebles*. **317**, 588, 72-E6 (1987)
- The Formation of Families of Twin Galaxies By String Loops. *Lennox L. Cowie and Esther M. Hu*. **318**, L33, 92-A9 (1987)
- The Redshift of the BL Lacertae Object PKS 2005–489. *R. Falomo, L.*

Galaxies: Redshifts—Continued

- Maraschi, E. G. Tanzi, and A. Treves. **318**, L39, 92-B1 (1987)
- Discovery of Low-Redshift, Neutral Hydrogen Absorption in the Radio Spectrum of PKS 2020 – 370. C. L. Carilli and J. H. van Gorkom. **319**, 683, 102-D8 (1987)
- Imaging Redshift Estimates for Two BL Lacertae Objects. W. Romanishin. **320**, 586, 116-A14 (1987)
- Near-Infrared Observations of Submillijansky Radio Sources: Evidence for a Population of Starburst Galaxies at Intermediate Redshifts. Trinh X. Thuan and J. J. Condon. **322**, L9, 145-A11 (1987)
- Multiperture Spectroscopy of Galaxies in Abell 370. J. Patrick Henry and Russell J. Lavery. **323**, 473, 159-F9 (1987)
- H I Detection Survey of a Complete Magnitude-limited Sample of Dwarf Irregular Galaxies in the Virgo Cluster Area. G. Lyle Hoffman, George Helou, E. E. Salpeter, John Glosson, and A. Sandage. **63**, 247, 4-A5 (1987) (Abstr. in **312**, 964, 13-E5)
- H I Survey of Face-on Galaxies: The Frequency of Distortions in H I Disks. B. M. Lewis. **63**, 515, 9-A5 (1987) (Abstr. in **313**, 928, 26-G11)
- A Compilation of Redshifts and Velocity Dispersions for Abell Clusters. Mitchell F. Struble and Herbert J. Rood. **63**, 543, 9-C7 (1987) (Abstr. in **313**, 928, 26-G11)
- Mass-to-Light Ratios of Binary Galaxies. I. Radial Velocities. Linda Y. Schweizer. **64**, 411, 22-D3 (1987) (Abstr. in **316**, 859, 61-E1)
- Spectroscopy and Photometry of Elliptical Galaxies. II. The Spectroscopic Parameters. Roger L. Davies, David Burstein, Alan Dressler, S. M. Faber, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner. **64**, 581, 26-B1 (1987) (Abstr. in **318**, 944, 91-C9)

Galaxies: Seyfert

- Gas Clouds in Galactic Bulges. William G. Mathews and Stephen D. Murray. **312**, 66, 1-F12 (1987)
- Variability of the Optical Spectrum of NGC 5548 and Evidence for a Multiple-Component Broad-Line Region. Bradley M. Peterson. **312**, 79, 1-G11 (1987)
- Narrow-Line Seyfert Galaxies with Permitted Fe II Emission: Markarian 507, 5C 3.100, and I Zwicky 1. J. P. Halpern and J. B. Oke. **312**, 91, 2-A9 (1987)
- Observations of Soft X-Ray Spectra from a Seyfert 1 and a Narrow Emission-Line Galaxy: Erratum. K. P. Singh, G. P. Garmire, and J. Nousek. **312**, 484, 6-B10 (1987) (Orig. paper in **297**, 633, 108-D10)
- Structure in the Nucleus of NGC 1068 at 10 Microns. R. Tresch-Fienberg, G. G. Fazio, D. Y. Gezari, W. F. Hoffmann, G. M. Lamb, P. K. Shu, and C. R. McCreight. **312**, 542, 8-G2 (1987)
- Star Formation in Seyfert Galaxies. J. M. Rodriguez Espinosa, Richard J. Rudy, and Barbara Jones. **312**, 555, 9-A1 (1987)
- The Double Broad-Line Emitting Regions in NGC 5548 as Possible Evidence for a Supermassive Binary. Bradley M. Peterson, Kirk T. Korista, and Stephen A. Cota. **312**, L1, 7-A4 (1987)
- Detection of CO(1 → 0) Emission and Optical Imaging of the Seyfert Galaxy/QSO Markarian 231. D. B. Sanders, J. S. Young, N. Z. Scoville, B. T. Soifer, and G. E. Danielson. **312**, L5, 7-A8 (1987)
- The Origin of the Photoionizing Continuum of Active Galactic Nuclei and Quasars. S. L. O'Dell, H. A. Scott, and W. A. Stein. **313**, 164, 16-F14 (1987)
- The Evolution of Active Galactic Nuclei. I. Models without Stellar Evolution. Laurence P. David, Richard H. Durisen, and Haldan N. Cohn. **313**, 556, 22-G9 (1987)
- Broad-Band Properties of the CFA Seyfert Galaxies. I. Radio Properties. R. A. Edelson. **313**, 651, 24-A1 (1987)
- An Unusual Radio Loop in the Edge-on Seyfert Galaxy NGC 5506. Ann E. Wehrle and Mark Morris. **313**, L43, 27-B1 (1987)
- IRAS 00521 – 7054: An Unusually Warm Galaxy. Jay A. Frogel and J. H. Elias. **313**, L53, 27-B10 (1987)
- The Ultraviolet Spectra of Intermediate-Redshift Quasars. II. A. L. Kinney, P. J. Huggins, A. E. Glassgold, and J. N. Bregman. **314**, 145, 29-E7 (1987)
- The Continuum of Type I Seyfert Galaxies. I. A Single Form Modified by the Effects of Dust. Martin Ward, Martin Elvis, G. Fabbiano, N. P. Carleton, S. P. Willner, and A. Lawrence. **315**, 74, 40-F12 (1987)
- The X-Ray Spectrum of NGC 1068. R. Monier and J. P. Halpern. **315**, L17, 45-B6 (1987)
- A Seyfert Nucleus of a New Ring Galaxy in Sextans. Ken-ichi Wakamatsu and Mitsugu T. Nishida. **315**, L23, 45-B12 (1987)
- Near-Infrared Spectra of Seyfert Nuclei. I. The Reddening Problem. Martin J. Ward, Thomas Geballe, Malcolm Smith, Richard Wade, and Peredur Williams. **316**, 138, 51-D13 (1987)
- The Radio Morphology of 3C 120 on Scales from 0.5 Parsecs to 400 Kiloparsecs. R. C. Walker, J. M. Benson, and S. C. Unwin. **316**, 546, 58-A5 (1987)
- Broad, Variable Absorption Lines in the Seyfert Galaxy NGC 3516: Probing the Structure of the Emission-Line Regions. G. Mark Voit, J. Michael Shull, and Mitchell C. Begelman. **316**, 573, 58-C5 (1987)

Spectroscopy and Imaging of Markarian 78 and I Zw 92. M. M. De Robertis. **316**, 597, 58-E7 (1987)

IRAS 23060 + 0505: A Highly Obscured $3.3 \times 10^{12} L_{\odot}$ Active Galaxy. G. J. Hill, C. G. Wynn-Williams, and E. E. Becklin. **316**, L11, 56-A14 (1987)

Discovery of Broad Brackett- α Emission in Arp 220. D. L. DePoy, E. E. Becklin, and T. R. Geballe. **316**, L63, 62-B8 (1987)

The X-Ray Spectrum of Markarian 509 Observed by EXOSAT. M. Morini, N. A. Lipani, and D. Molteni. **317**, 145, 65-E3 (1987)

The Ultraviolet and Optical Emission-Line Spectrum of III Zw 77. Gary J. Ferland and Donald E. Osterbrock. **318**, 145, 80-E3 (1987)

The Continuum of Type I Seyfert Galaxies. II. Separating Thermal and Nonthermal Components. N. P. Carleton, Martin Elvis, G. Fabbiano, S. P. Willner, A. Lawrence, and Martin Ward. **318**, 595, 87-D6 (1987)

Photoerosion of Nuclei in Quasar Emission-Line Regions. R. N. Boyd and G. J. Ferland. **318**, L21, 85-B8 (1987)

Kinematics and Ionization of Extended Gas in Active Galaxies. III. The Extranuclear Properties of NGC 1068. J. A. Baldwin, A. S. Wilson, and Mark Whittle. **319**, 84, 94-A3 (1987)

A Radiative Bow Shock Wave (?) Driven by Nuclear Ejecta in a Seyfert Galaxy. Andrew S. Wilson and James S. Ulvestad. **319**, 105, 94-B11 (1987)

H II Region Abundances in Seyfert Galaxies. I. N. Evans and M. A. Dopita. **319**, 662, 102-B12 (1987)

Zw 15107 + 0724 and the Family of OH Megamasers. Willem A. Baan, Christian Henkel, and Aubrey D. Haschick. **320**, 154, 109-F6 (1987)

Molecular Hydrogen Line Emission in Seyfert Galactic Nuclei. J. Fischer, T. R. Geballe, Howard A. Smith, M. Simon, and J. W. V. Storey. **320**, 667, 117-B2 (1987)

Fe K Features as Probes of the Nuclear Reflection Region in Seyfert Galaxies. Julian H. Krolik and Timothy R. Kallman. **320**, L5, 114-A8 (1987)

On Nonthermal Models for Active Galactic Nuclei. David L. Band. **321**, 80, 123-A9 (1987)

Broad-Band Properties of the CFA Seyfert Galaxies. II. Infrared to Millimeter Properties. R. A. Edelson, M. A. Malkan, and G. H. Rieke. **321**, 233, 124-G1 (1987)

A Detailed Study of the C IV $\lambda 1550$ Line Profile and Adjacent Spectral Features in NGC 4151 from 1978 to 1983. J. Clavel, A. Altamir, A. Boksenberg, G. E. Bromage, A. Elvijs, D. Pelat, M. V. Penston, G. C. Perola, M. A. J. Snijders, and M. H. Ulrich. **321**, 251, 125-A5 (1987)

Far-Infrared Continuum Emission from the Nucleus, Starburst, and Extended Spiral Arms of NGC 1068. D. F. Lester, M. Joy, P. M. Harvey, H. B. Ellis, Jr., and P. S. Parmar. **321**, 755, 132-G1 (1987)

VLBI Structure of 3C 84 at 89 GHz. D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman. **322**, 74, 138-F11 (1987)

Constraints on Possible Precursor AGN Sources of the Cosmic X-Ray Background. Elihu Boldt and Darryl Leiter. **322**, L1, 145-A4 (1987)

Optical Spectra of Narrow Emission Line Palomar-Green Galaxies. Donald E. Osterbrock and Richard W. Pogge. **323**, 108, 154-C4 (1987)

Far-Infrared Variability in Active Galactic Nuclei. R. A. Edelson and M. A. Malkan. **323**, 516, 160-B14 (1987)

Spectral Classification of Emission-Line Galaxies. Sylvain Veilleux and Donald E. Osterbrock. **63**, 295, 4-G1 (1987) (Abstr. in **312**, 965, 13-E6)

The Accuracy of Cross-Correlation Estimates of Quasar Emission-Line Region Sizes. C. Martin Gaskell and Bradley M. Peterson. **65**, 1, 28-A5 (1987) (Abstr. in **319**, 1011, 106-A9)

Galaxies: Stellar Content

Infrared Characteristics of the Nuclei of Normal Galaxies. Nicholas A. Devereux, E. E. Becklin, and Nick Scoville. **312**, 529, 8-F3 (1987)

NGC 3928: A Highly Bulge-dominated Compact Spiral Galaxy. Yoshiaki Taniguchi and Masaki Watanabe. **313**, 89, 16-A5 (1987)

Tidal Stripping and Accretion in Clusters of Galaxies with Smoothly Distributed Missing Mass. Juan C. Muzzio, Victor H. Dussanuet, and M. Marcela Vergne. **313**, 112, 16-C4 (1987)

Population Studies: The Nature of the Thick Disk. John Norris. **314**, L39, 39-B4 (1987)

The Relationship between Stellar Population and Radio Continuum Emission in Spiral Galaxies. David Burstein, J. J. Condon, and Q. F. Yin. **315**, L99, 49-C8 (1987)

Dark Clusters in Galactic Halos? B. J. Carr and C. G. Lacey. **316**, 23, 50-C6 (1987)

IRAS Observations of Starburst and Nonactive Spiral Galaxies. Kazuhiro Sekiguchi. **316**, 145, 51-E6 (1987)

A Reanalysis of Galactic Primary Nucleosynthesis. Bruce A. Twarog and J. Craig Wheeler. **316**, 153, 51-F1 (1987)

Observations of RR Lyrae Stars in the Halo of M31. Christopher J.

- Pritchett and Sidney van den Bergh*. **316**, 517, 57-F2 (1987)
- The Effects of Stimulated Star Formation on the Evolution of the Galaxy. III. The Chemical Evolution of Nonlinear Systems. *Steven N. Shore, Federico Ferrini, and Francesco Palla*. **316**, 663, 59-C14 (1987)
- A Very Deep IRAS Survey: Constraints on the Evolution of Starburst Galaxies. *Perry Hacking, J. J. Condon, and J. R. Houck*. **316**, L15, 56-B4 (1987)
- The Spatial Distribution and Population of Novae in M31. *Robin Ciardullo, Holland C. Ford, James D. Neill, George H. Jacoby, and Allen W. Shafter*. **318**, 520, 86-E6 (1987)
- Numerical Models of Star Formation in X-Ray Cluster Cooling Flows. *Raymond E. White III and Craig L. Sarazin*. **318**, 629, 87-F14 (1987)
- Bimodal Star Formation: Constraints from Galaxy Colors at High Redshift. *Rosemary F. G. Wyse and Joseph Silk*. **319**, L1, 100-A4 (1987)
- Global Properties of Interacting Disk-Type Galaxies. *Howard A. Bushouse*. **320**, 49, 108-E4 (1987)
- M Giants in Baade's Window: Infrared Colors, Luminosities, and Implications for the Stellar Content of E and S0 Galaxies. *Jay A. Frogel and A. E. Whitford*. **320**, 199, 110-C10 (1987)
- Wolf-Rayet Stars in the Andromeda Galaxy. *Anthony F. J. Moffat and Michael M. Shara*. **320**, 266, 111-A9 (1987)
- On the Distribution of Colors for Stars in the Ninth to Fifteenth Magnitude Range: Statistics and Implications for Galactic Structure. *Barry M. Lasker, Peter M. Garnavich, and Anne P. Reynolds*. **320**, 502, 115-A3 (1987)
- A New Ionization Model for Galaxies with Dominant Star-Formation Regions. *Rodger I. Thompson*. **321**, 153, 123-G11 (1987)
- Spectral Synthesis in the Ultraviolet. I. Far-Ultraviolet Stellar Library. *Michael N. Fanelli, Robert W. O'Connell, and Trinh X. Thuan*. **321**, 768, 133-A1 (1987)
- The Appearance of Primeval Galaxies. *E. Baron and Simon D. M. White*. **322**, 585, 146-C1 (1987)
- The M31 Globular Cluster System: Erratum. *D. Crampton, A. P. Cowley, D. Schade, and P. Chayer*. **322**, 1074, 151-F12 (1987) (Orig. paper in **288**, 494, 8-B2)
- The Late-Type Stellar Content of NGC 55. *Christopher J. Pritchett, Harvey B. Richer, David Schade, Dennis Crabtree, and H. K. C. Yee*. **323**, 79, 154-A3 (1987)
- Multiperture Spectroscopy of Galaxies in Abell 370. *J. Patrick Henry and Russell J. Lavery*. **323**, 473, 159-F9 (1987)
- Models of Ring Galaxies. II. Extended Starbursts. *Curtis Struck-Marcell and P. N. Appleton*. **323**, 480, 159-G5 (1987)
- The Structure and Dynamics of Ringed Galaxies. III. Surface Photometry and Kinematics of the Ringed Nonbarred Spiral NGC 7531. *R. Buta*. **64**, 1, 17-A5 (1987) (Abstr. in **315**, 730, 48-E11)
- Theoretical Isochrones for Old, Super-Metal-rich Stars. *Don A. Vandenberg and P. G. Laskarides*. **64**, 103, 18-C9 (1987) (Abstr. in **312**, 965, 13-E6)
- Galaxies: Structure**
- Shells and Dark Matter in Elliptical Galaxies. *Lars Hernquist and P. J. Quinn*. **312**, 1, 1-A7 (1987)
- Shell Galaxies and Alternatives to the Dark Matter Hypothesis. *Lars Hernquist and P. J. Quinn*. **312**, 17, 1-B9 (1987)
- The Quadrupole Gravitational Lens. *Israel Kooner*. **312**, 22, 1-B14 (1987)
- Detection of the Lensing Galaxy in PG 1115 + 080. *C. A. Christian, D. Crabtree, and P. Waddell*. **312**, 45, 1-D10 (1987)
- Properties of the X-Ray Emitting Gas in Early-Type Galaxies. *Claude R. Canizares, Giuseppina Fabbiano, and Ginevra Trinchieri*. **312**, 503, 8-D5 (1987)
- Weak Disks in Rapidly Rotating Elliptical Galaxies. *D. Carter*. **312**, 514, 8-E2 (1987)
- Structure in the Nucleus of NGC 1068 at 10 Microns. *R. Tresch-Fienberg, G. G. Fazio, D. Y. Gezari, W. F. Hoffmann, G. M. Lamb, P. K. Shu, and C. R. McCreight*. **312**, 542, 8-G2 (1987)
- Star Formation Rates in Ring Galaxies from IRAS Observations. *P. N. Appleton and Curtis Struck-Marcell*. **312**, 566, 9-A12 (1987)
- The Intensity Ratio in Different Wave Bands between Images of Gravitationally Lensed Quasars as a Probe of Dark Matter. *Kandaswamy Subramanian and S. M. Chitre*. **313**, 13, 15-B5 (1987)
- Fundamental Properties of Elliptical Galaxies. *S. Djorgovski and Marc Davis*. **313**, 59, 15-E14 (1987)
- NGC 5266: An Elliptical Galaxy with a Dust Ring. *S. R. Varnas, F. Bertola, G. Galletta, K. C. Freeman, and D. Carter*. **313**, 69, 15-F12 (1987)
- NGC 3928: A Highly Bulge-dominated Compact Spiral Galaxy. *Yoshiaki Taniguchi and Masaaki Watanabe*. **313**, 89, 16-A5 (1987)
- Tidal Stripping and Accretion in Clusters of Galaxies with Smoothly Distributed Missing Mass. *Juan C. Muzzio, Victor H. Dossanuet, and M. Marcela Vergne*. **313**, 112, 16-C4 (1987)
- A Model for the Emission from the Bulge of Our Galaxy. *M. Rowan-Robinson and T. Chester*. **313**, 413, 19-E4 (1987)
- The Evolution of Active Galactic Nuclei. I. Models without Stellar Evolution. *Laurence P. David, Richard H. Durisen, and Haldan N. Cohn*. **313**, 556, 22-G9 (1987)
- Arm Classifications for Spiral Galaxies. *Debra Meloy Elmegreen and Bruce G. Elmegreen*. **314**, 3, 28-A10 (1987)
- The Role of Orbital Dynamics and Cloud-Cloud Collisions in the Formation of Giant Molecular Clouds in Global Spiral Structures. *William W. Roberts, Jr. and Glen R. Stewart*. **314**, 10, 28-B4 (1987)
- Jet Collimation by Turbulent Viscosity. *I. R. N. Henriksen*. **314**, 33, 28-D1 (1987)
- The H I Distribution and Kinematics in Four Low-Luminosity Elliptical Galaxies. *George Lake, R. A. Schommer, and J. H. van Gorkom*. **314**, 57, 28-E12 (1987)
- A Bright Optical Synchrotron Counterpart of the Western Hot Spot in Pictor A. *Hermann-Josef Röser and Klaus Meisenheimer*. **314**, 70, 28-G1 (1987)
- A Large Molecular Cloud in Lupus Far From the Galactic Plane. *L. Å. Nyman, P. Thaddeus, L. Bronfman, and R. S. Cohen*. **314**, 374, 32-C4 (1987)
- The Shape of the Dark Halo in Polar-Ring Galaxies. *Bradley C. Whitmore, Douglas B. McElroy, and François Schweizer*. **314**, 439, 34-C9 (1987)
- H I Maps of S0 Galaxies with Polar Rings. *J. H. van Gorkom, Paul L. Schechter, and Jerome Kristian*. **314**, 457, 34-E3 (1987)
- Triaxial Scale-free Models of Highly Flattened Elliptical Galaxies with and without Massive Halos. *Harold F. Levinson and Douglas O. Richstone*. **314**, 476, 34-F9 (1987)
- Population Studies: The Nature of the Thick Disk. *John Norris*. **314**, L39, 39-B4 (1987)
- The Most Luminous Far-Infrared Extragalactic Sources. *M. Harwit, J. R. Houck, B. T. Soifer, and G. G. C. Palumbo*. **315**, 28, 40-C6 (1987)
- The Spatial and Mass Distributions of Molecular Clouds and Spiral Structures. *John Kwan and Francisco Valdes*. **315**, 92, 41-A2 (1987)
- Molecular Clouds and the Gould Belt. *David K. Taylor, R. L. Dickman, and N. Z. Scoville*. **315**, 104, 41-B2 (1987)
- Molecular Clouds in the Carina Arm: Large-Scale Properties of Molecular Gas and Comparison with H I. *D. A. Grabelsky, R. S. Cohen, L. Bronfman, P. Thaddeus, and J. May*. **315**, 122, 41-D2 (1987)
- Deconvolution of Elliptical Nuclei of Galaxies: Application to M81: Erratum. *O. Bendinelli, G. Parmeggiani, and T. Zappati*. **315**, 408, 44-C14 (1987) (Orig. paper in **308**, 611, 115-E14)
- A Near-Infrared Study of the Luminous Merging Galaxies NGC 2623 and Arp 148. *Marshall Joy and Paul M. Harvey*. **315**, 480, 46-A4 (1987)
- Supernovae versus Models of the Interstellar Medium and the Gaseous Halo. *Carl Heiles*. **315**, 555, 46-F10 (1987)
- Dark Clusters in Galactic Halos? *B. J. Carr and C. G. Lacey*. **316**, 23, 50-C6 (1987)
- Large-Scale Clustering of Galaxies with Massive Dark Halos. II. Mass-to-Light Profiles and Dynamical Mass Estimates of Galaxy Groups. *August E. Evrard*. **316**, 36, 50-D6 (1987)
- Astrophysical Implications of the Multifrequency VLA Observations of NGC 1265. *Christopher P. O'Dea and Frazer N. Owen*. **316**, 95, 51-A11 (1987)
- Narrow-Angle Tail Radio Sources and the Distribution of Galaxy Orbits in Abell Clusters. *Christopher P. O'Dea, Craig L. Sarazin, and Frazer N. Owen*. **316**, 113, 51-C1 (1987)
- Cosmological Accretion Wakes. *Edmund Bertschinger*. **316**, 489, 57-D1 (1987)
- The Evolution of Active Galactic Nuclei. II. Models with Stellar Evolution. *Laurence P. David, Richard H. Durisen, and Haldan N. Cohn*. **316**, 505, 57-E4 (1987)
- Broad, Variable Absorption Lines in the Seyfert Galaxy NGC 3516: Probing the Structure of the Emission-Line Regions. *G. Mark Voit, J. Michael Shull, and Mitchell C. Begelman*. **316**, 573, 58-C5 (1987)
- Gravitational Lensing by an Ensemble of Isothermal Galaxies. *Neal Katz and Bohdan Paczyński*. **317**, 11, 64-B3 (1987)
- Dark Matter in the Universe: Massive Neutrinos Revisited. *R. Cowik and P. Ghosh*. **317**, 26, 64-C4 (1987)
- Dynamics of the Outer Disk and Halo of M31. *Richard Nolthenius and Holland C. Ford*. **317**, 62, 64-E13 (1987)
- 1.4 GHz Continuum Sources in the Cancer Cluster. *E. E. Salpeter and J. M. Dickey*. **317**, 102, 65-B1 (1987)
- Nonuniqueness of Self-consistent Equilibrium Solutions for the Perfect Elliptic Disk. *P. T. de Zeeuw, C. Hunter, and M. Schwarzschild*. **317**, 607, 72-F11 (1987)
- Dust Distribution in Spiral Galaxies. *Nikolaos D. Kylafis and John N. Bahcall*. **317**, 637, 73-A13 (1987)

Galaxies: Structure—Continued

- The Correlation of Spiral Arm Molecular Clouds with Cold Atomic Hydrogen. *W. L. Peters and F. N. Bash.* **317**, 646, 73-B8 (1987)
- Molecular Spiral Structure in M51. *K. Y. Lo, R. Ball, C. R. Masson, T. G. Phillips, S. Scott, and D. P. Woody.* **317**, L63, 78-B11 (1987)
- Models of Ring Galaxies. I. The Growth and Disruption of Clouds in the Expanding Density Wave. *P. N. Appleton and Curtis Struck-Marcell.* **318**, 103, 80-A14 (1987)
- Numerical Models of Star Formation in X-Ray Cluster Cooling Flows. *Raymond E. White III and Craig L. Sarazin.* **318**, 629, 87-F14 (1987)
- The Formation of Families of Twin Galaxies By String Loops. *Lennox L. Cowie and Esther M. Hu.* **318**, L33, 92-A9 (1987)
- Nonlinear Coupling of Galactic Spiral Modes. *M. Tagger, J. F. Sygnet, E. Athanassoula, and R. Pellat.* **318**, L43, 92-B4 (1987)
- An Analytically Soluble Problem in Fully Nonlinear Statistical Gravitational Lensing. *P. Schneider.* **319**, 9, 93-B1 (1987)
- Dynamical Instability of a Model of M87. *David Merritt.* **319**, 55, 93-E14 (1987)
- Formation of Stellar Shells and X-Ray Coronae around Elliptical Galaxies. *Masayuki Umemura and Satoru Ikeuchi.* **319**, 601, 101-E5 (1987)
- Evolution of Hot Galactic Flows. *Michael Loewenstein and William G. Mathews.* **319**, 614, 101-F4 (1987)
- On the Thermal Instability of Galactic and Cluster Halos. *A. Malagoli, R. Rosner, and G. Bodo.* **319**, 622, 101-G8 (1987)
- B2 0800 + 24: A Narrow-Angle Tail Radio Galaxy in a Small Group of Galaxies. *John T. Stocke and Jack O. Burns.* **319**, 671, 102-C8 (1987)
- Steady State Cooling Flow Models for Normal Elliptical Galaxies. *Craig L. Sarazin and Raymond E. White III.* **320**, 32, 108-C11 (1987)
- Global Properties of Interacting Disk-Type Galaxies. *Howard A. Bushouse.* **320**, 49, 108-E4 (1987)
- The Leo Triplet Spiral Galaxy NGC 3628. II. VLA Observations of the Hydroxyl Absorption. *J. T. Schmelz, W. A. Baan, and A. D. Haschick.* **320**, 145, 109-E11 (1987)
- The Structure and Evolution of Hoag's Object. *François Schweizer, W. Kent Ford, Jr., Robert Jedrzejewski, and Riccardo Giovanelli.* **320**, 454, 114-D3 (1987)
- Distant Satellites as Probes of Our Galaxy's Mass Distribution. *Blane Little and Scott Tremaine.* **320**, 493, 114-G6 (1987)
- On the Distribution of Colors for Stars in the Ninth to Fifteenth Magnitude Range: Statistics and Implications for Galactic Structure. *Barry M. Lasker, Peter M. Garnavich, and Anne P. Reynolds.* **320**, 502, 115-A3 (1987)
- The Formation of the Exponential Disk in Spiral Galaxies. *D. N. C. Lin and J. E. Pringle.* **320**, L87, 121-B6 (1987)
- Observable Properties of E0 Triaxial Galaxies: A Test for Triaxiality. *Harold F. Levison.* **320**, L93, 121-B11 (1987)
- Self-consistent Models of Perfect Triaxial Galaxies. *Thomas S. Statler.* **321**, 113, 123-D1 (1987)
- The Dynamics of Small Groups of Galaxies. I. Virialized Groups. *Gary A. Mamon.* **321**, 622, 131-D2 (1987)
- Gravitational Imaging by Isolated Elliptical Potential Wells. II. Probability Distributions. *Christopher S. Kochanek and Roger D. Blandford.* **321**, 676, 132-A3 (1987)
- The Triple Radio Source 0023 + 171: A Candidate for a Dark Gravitational Lens. *J. N. Hewitt, E. L. Turner, C. R. Lawrence, D. P. Schneider, J. E. Gunn, C. L. Bennett, B. F. Burke, J. H. Mahoney, G. I. Langston, M. Schmidt, J. B. Oke, and J. G. Hoessel.* **321**, 706, 132-C5 (1987)
- Far-Infrared Continuum Emission from the Nucleus, Starburst, and Extended Spiral Arms of NGC 1068. *D. F. Lester, M. Joy, P. M. Harvey, H. B. Ellis, Jr., and P. S. Parmar.* **321**, 755, 132-G1 (1987)
- A Correlation between the Radio and Optical Morphologies of Distant 3CR Radio Galaxies. *Patrick J. McCarthy, Wil van Breugel, Hyron Spinrad, and S. Djorgovski.* **321**, L29, 129-D3 (1987)
- The Origin of the Diffuse X-Ray Background and the Formation of Galaxies and Voids. *Ruth A. Daly.* **322**, 20, 138-B12 (1987)
- The Vertical Structure of Galactic Disks. *R. G. Carlberg.* **322**, 59, 138-E9 (1987)
- Molecules in Galaxies. V. CO Observations of Flocculent and Grand-Design Spirals. *Antony A. Stark, Bruce G. Elmegreen, and Don Chance.* **322**, 64, 138-F1 (1987)
- VLBI Structure of 3C 84 at 89 GHz. *D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman.* **322**, 74, 138-F11 (1987)
- Axisymmetric Shell Models with Stäckel Potentials. *Jeffrey L. Bishop.* **322**, 618, 146-E7 (1987)
- On Stable Hydrostatic Equilibrium Configurations of the Galaxy and Implications for Its Halo. *J. B. G. M. Bloemen.* **322**, 694, 147-D1 (1987)
- A Composite CO Survey of the Entire Milky Way. *T. M. Dame, H. Ungerechts, B. S. Cohen, E. J. de Geus, I. A. Grenier, J. May, D. C. Murphy, L.-A. Nyman, and P. Thaddeus.* **322**, 706, 147-D13 (1987)
- The Linear Filaments of the Radio Arc near the Galactic Center. *Farhad Yusef-Zadeh and Mark Morris.* **322**, 721, 147-F7 (1987)
- PG 1411 + 442: The Nearest Broad Absorption Line Quasar. *Matthew A. Malkan, Richard F. Green, and John B. Hutchings.* **322**, 729, 147-G6 (1987)
- The M31 Globular Cluster System: Erratum. *D. Crampton, A. P. Cowley, D. Schade, and P. Chayer.* **322**, 1074, 151-F12 (1987) (Orig. paper in **288**, 494, 8-B2)
- The Spatial Distribution of 10 Micron Luminosity in Spiral Galaxies. *Nicholas Devereux.* **323**, 91, 154-B1 (1987)
- Results from a Visual Survey of All 2712 Abell Clusters. *Mitchell F. Struble and Herbert J. Rood.* **323**, 468, 159-F4 (1987)
- Models of Ring Galaxies. II. Extended Starbursts. *Curtis Struck-Marcell and P. N. Appleton.* **323**, 480, 159-G5 (1987)
- Forbidden [O II] and [O III] Emission 29" from a QSO Absorption-Line Region. *Brian Yanny, Don Hamilton, R. A. Schommer, T. B. Williams, and D. G. York.* **323**, L19, 158-B7 (1987)
- The Luminosity-Velocity Diagram: A New Distance Estimator for Spiral Galaxies? *Barry F. Madore and David Woods.* **323**, L25, 158-B13 (1987)
- Neutral Hydrogen in Compact Groups of Galaxies. *B. A. Williams and Herbert J. Rood.* **323**, 265, 4-C8 (1987) (Abstr. in **312**, 964, 13-E5)
- A Catalog of Morphological Properties of the 2712 Abell Clusters. *Mitchell F. Struble and Herbert J. Rood.* **323**, 555, 9-D4 (1987) (Abstr. in **313**, 929, 26-G12)
- Radio Continuum Observations of Early- and Late-Type Spiral Galaxies. *Isabella M. Gioia and Giuseppina Fabbiano.* **323**, 771, 13-A13 (1987) (Abstr. in **314**, 831, 38-F7)
- The Structure and Dynamics of Ringed Galaxies. III. Surface Photometry and Kinematics of the Ringed Nonbarred Spiral NGC 7531. *R. Buta.* **323**, 1, 17-A5 (1987) (Abstr. in **315**, 730, 48-E11)
- The Structure and Dynamics of Ringed Galaxies. IV. Surface Photometry and Kinematics of the Ringed Barred Spiral NGC 6300. *R. Buta.* **323**, 383, 22-A5 (1987) (Abstr. in **316**, 859, 61-E1)
- Spectroscopy and Photometry of Elliptical Galaxies. III. UBV Aperture Photometry, CCD Photometry, and Magnitude-related Parameters. *David Burstein, Roger L. Davies, Alan Dressler, S. M. Faber, Remington P. S. Stone, Donald Lynden-Bell, Roberto J. Terlevich, and Gary Wegner.* **323**, 601, 26-C7 (1987) (Abstr. in **318**, 944, 91-C9)
- The Structure of Brightest Cluster Members. II. Mergers. *James M. Schombert.* **323**, 643, 26-G2 (1987) (Abstr. in **318**, 945, 91-C10)
- A 1.49 GHz Atlas of Spiral Galaxies with $B_T \leq +12$ and $\delta \geq -45^\circ$. *J. J. Condon.* **323**, 485, 36-B1 (1987) (Abstr. in **322**, 1075, 151-G1)
- A 1.49 GHz Supplementary Atlas of Spiral Galaxies with H -Magnitudes. *J. J. Condon, Q. F. Yin, and David Burstein.* **323**, 543, 36-G1 (1987) (Abstr. in **322**, 1075, 151-G1)
- Galaxies: The Galaxy**
- A Model for the Emission from the Bulge of Our Galaxy. *M. Rowan-Robinson and T. Chester.* **313**, 413, 19-E4 (1987)
- A Large Molecular Cloud in Lupus Far From the Galactic Plane. *L.-Å. Nyman, P. Thaddeus, L. Bronfman, and R. S. Cohen.* **314**, 374, 32-C4 (1987)
- Molecular Gas Within 2° of the Galactic Center. I. Survey of ^{13}C Emission. *Gary M. Heiligman.* **314**, 747, 37-G1 (1987)
- Population Studies: The Nature of the Thick Disk. *John Norris.* **314**, L39, 39-B4 (1987)
- The Spatial and Mass Distributions of Molecular Clouds and Spiral Structures. *John Kwan and Francisco Valdes.* **315**, 92, 41-A2 (1987)
- Molecular Clouds and the Gould Belt. *David K. Taylor, R. L. Dickman, and N. Z. Scoville.* **315**, 104, 41-B2 (1987)
- Molecular Clouds in the Carina Arm: Large-Scale Properties of Molecular Gas and Comparison with H I. *D. A. Grabelsky, R. S. Cohen, L. Bronfman, P. Thaddeus, and J. May.* **315**, 122, 41-D2 (1987)
- Supernovae versus Models of the Interstellar Medium and the Gaseous Halo. *Carl Heiles.* **315**, 555, 46-F10 (1987)
- A New Constraint on the Galactic Plane ^{26}Al Distribution. *C. J. MacCullum, A. F. Hutters, P. D. Stang, and M. Leventhal.* **317**, 877, 75-F1 (1987)
- Radial Velocities of Late-Type Stars in the Galactic Center. *K. Seligren, D. N. B. Hall, S. G. Kleinmann, and N. Z. Scoville.* **317**, 881, 75-F5 (1987)
- Discovery of Three Obscured Globular Clusters. *S. Djorgovski.* **317**, L13, 71-B2 (1987)
- High-Energy Gamma Rays Probing Cosmic-Ray Spectral Differences throughout the Galaxy. *J. B. G. M. Bloemen.* **317**, L15, 71-B5 (1987)
- Map of the Galactic Center Region in the 1.8 MeV ^{26}Al Gamma-Ray Line. *P. von Ballmoos, R. Diehl, and V. Schönfelder.* **318**, 654, 88-B1 (1987)

- (1987)
 Mass, Luminosity, and Line Width Relations of Galactic Molecular Clouds. *P. M. Solomon, A. R. Rivolo, J. Barrett, and A. Yahil*. **319**, 730, 103-A8 (1987)
 A Shocked-Jet Model of the Galactic Center Bridge and the Radio Arc. *Yoshiaki Sofue and Mitsuaki Fujimoto*. **319**, L73, 107-D11 (1987)
 M Giants in Baade's Window: Infrared Colors, Luminosities, and Implications for the Stellar Content of E and S0 Galaxies. *Jay A. Frogel and A. E. Whitford*. **320**, 199, 110-C10 (1987)
 Distant Satellites as Probes of Our Galaxy's Mass Distribution. *Blane Little and Scott Tremaine*. **320**, 493, 114-G6 (1987)
 On the Distribution of Colors for Stars in the Ninth to Fifteenth Magnitude Range: Statistics and Implications for Galactic Structure. *Barry M. Lasker, Peter M. Garnavich, and Anne P. Reynolds*. **320**, 502, 115-A3 (1987)
 Structural Details of the Sagittarius A Complex: Evidence for a Large-Scale Poloidal Magnetic Field in the Galactic Center Region. *F. Yusef-Zadeh and M. Morris*. **320**, 545, 115-D12 (1987)
 The Broad-Line Region at the Center of the Galaxy. *T. R. Geballe, R. Wade, K. Krisciunas, I. Gatley, and M. C. Bird*. **320**, 562, 115-F12 (1987)
 Ionization State in and Reddening to the Center of the Galaxy. *R. Wade, T. R. Geballe, K. Krisciunas, I. Gatley, and M. C. Bird*. **320**, 570, 115-G7 (1987)
 Large-Scale Galactic Dust Morphology and Physical Conditions from IRAS Observations. *T. J. Soderoski, E. Dwek, M. G. Hauser, and F. J. Kerr*. **322**, 101, 139-A10 (1987)
 On Stable Hydrostatic Equilibrium Configurations of the Galaxy and Implications for Its Halo. *J. B. G. M. Bloemen*. **322**, 694, 147-D1 (1987)
 A Composite CO Survey of the Entire Milky Way. *T. M. Dame, H. Ungerechts, R. S. Cohen, E. J. de Geus, J. A. Grenier, J. May, D. C. Murphy, L.-A. Nyman, and P. Thaddeus*. **322**, 706, 147-D13 (1987)
 The Linear Filaments of the Radio Arc near the Galactic Center. *Farhad Yusef-Zadeh and Mark Morris*. **322**, 721, 147-F7 (1987)
 Properties of Evolved Mass-losing Stars in the Milky Way and Variations in the Interstellar Dust Composition. *Harley A. Thronson, Jr., William B. Latter, John H. Black, John Bally, and Perry Hacking*. **322**, 770, 148-C5 (1987)
 A Search for QSOs to Fit a Cosmological Model with Flat, Closed Spatial Sections. *H. V. Fagundes and U. F. Wichoski*. **322**, L5, 145-A8 (1987)
 A View of the Galactic H α Background: $208^\circ \leq l \leq 218^\circ$; $-2^\circ \leq b \leq +8^\circ$. *R. J. Reynolds*. **323**, 118, 154-D2 (1987)
 Nuclear Chronometers from the r -Process and the Age of the Galaxy. *John J. Cowan, F.-K. Thielemann, and J. W. Truran*. **323**, 543, 160-F1 (1987)
 H α Scans of High-Velocity Clouds. *R. J. Reynolds*. **323**, 553, 160-F11 (1987)
 Molecular Clouds and Cloud Cores in the Inner Galaxy. *N. Z. Scoville, Min Su Yun, D. P. Clemens, D. B. Sanders, and W. H. Waller*. **63**, 821, 13-G12 (1987) (Abstr. in **314**, 832, 38-F8)
 Theoretical Isochrones for Old, Super-Metal-rich Stars. *Don A. Vandenberg and P. G. Laskarides*. **64**, 103, 18-C9 (1987) (Abstr. in **312**, 965, 13-E6)
 Galactic Center Molecular Clouds. I. Spatial and Spatial-Velocity Maps. *John Bally, Antony A. Stark, Robert W. Wilson, and Christian Henkel*. **65**, 13, 28-B2 (1987) (Abstr. in **319**, 1011, 106-A9)
 A Flux-limited Sample of Galactic Carbon Stars. *M. J. Claussen, S. G. Kleinmann, R. R. Joyce, and M. Jura*. **65**, 385, 33-F1 (1987) (Abstr. in **321**, 1050, 136-A1)
- Galaxies: X-Rays**
 Narrow-Line Seyfert Galaxies with Permitted Fe II Emission: Markarian 507, SC 3.100, and I Zwicky 1. *J. P. Halpern and J. B. Oke*. **312**, 91, 2-A9 (1987)
 X-Rays from the Radio Halo of M87. *E. D. Feigelson, P. A. D. Wood, E. J. Schreier, D. E. Harris, and M. J. Reid*. **312**, 101, 2-B5 (1987)
 A Statistical Analysis of the Einstein Normal Galaxy Sample. III. Radio and X-Ray Properties of Elliptical and S0 Galaxies. *G. Fabbiano, U. Klein, G. Trinchieri, and R. Wiebeleski*. **312**, 111, 2-C1 (1987)
 Properties of the X-Ray Emitting Gas in Early-Type Galaxies. *Claude R. Canizares, Giuseppina Fabbiano, and Ginevra Trinchieri*. **312**, 503, 8-D5 (1987)
 Simultaneous Multifrequency Observations of the BL Lacertae Object Markarian 421. *F. Makino, Y. Tanaka, M. Matsuoka, K. Koyama, H. Inoue, K. Makishima, R. Hoshi, S. Hayakawa, Y. Kondo, C. M. Urry, S. L. Mufson, K. R. Hackney, L. R. Hackney, S. Kikuchi, Y. Mikami, W. Z. Wisniewski, N. Hiromoto, M. Nishida, J. Burnell, P. Brand, P. M. Williams, M. G. Smith, F. Takahara, M. Inoue, M. Tsuboi, H. Tabara, T. Kato, M. F. Aller, and H. D. Aller*. **313**, 662, 24-A12 (1987)
 X-Ray Observations of Spiral Galaxies. II. Images and Spectral Parameters of 13 Galaxies. *G. Fabbiano and G. Trinchieri*. **315**, 46, 40-D11 (1987)
 X-Ray-Selected AGNs near Bright Galaxies. *John T. Stocke, Peter Schneider, Simon L. Morris, Isabella M. Gioia, Tommaso Maccacaro, and Rudolph E. Schild*. **315**, L11, 45-A14 (1987)
 The X-Ray Spectrum of NGC 1068. *R. Monier and J. P. Halpern*. **315**, L17, 45-B6 (1987)
 1E 0116.3 - 0116: A Peculiar, X-Ray-Bright, Early-Type Galaxy. *D. Maccagni, I. M. Gioia, T. Maccacaro, R. E. Schild, and J. T. Stocke*. **316**, 132, 51-D6 (1987)
 Are the Virial Masses of Clusters Smaller Than We Think? *L. L. Cowie, M. Henriksen, and R. Mushotzky*. **317**, 593, 72-E11 (1987)
 Spartan 1 X-Ray Observations of the Perseus Cluster: Comparison of the Iron Abundances and Temperatures in the Inner and Outer Regions of the Cluster. *M. P. Ulmer, R. G. Cruddace, E. E. Fenimore, G. G. Fritz, and W. A. Snyder*. **319**, 118, 94-C11 (1987)
 Formation of Stellar Shells and X-Ray Coronae around Elliptical Galaxies. *Masayuki Umemura and Satoru Ikeuchi*. **319**, 601, 101-E5 (1987)
 Steady State Cooling Flow Models for Normal Elliptical Galaxies. *Craig L. Sarazin and Raymond E. White III*. **320**, 32, 108-C11 (1987)
 HEAO 1 Hard X-Ray Observations of Three Abell Clusters of Galaxies. *Y. Rephaeli, D. E. Gruber, and R. E. Rothschild*. **320**, 139, 109-E5 (1987)
- Gamma Rays: Bursts**
 Gamma-Ray Burst Counterparts: Infrared. *Bradley E. Schaefer, T. L. Cline, U. Desai, B. J. Teegarden, J.-L. Atteia, C. Barat, K. Hurley, M. Niel, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, I. V. Estulin, and A. V. Kuznetsov*. **313**, 226, 17-D9 (1987)
 Synchrotron Emission and Gamma-Ray Bursts. *J. J. Brainerd and D. Q. Lamb*. **313**, 231, 17-D14 (1987)
 The X-Ray Emission from Gamma-Ray Burst Sources: Constraints on Theoretical Models. *James N. Imamura and Richard I. Epstein*. **313**, 711, 24-E6 (1987)
 Gamma-Ray Bursts from Superconducting Cosmic Strings at Large Redshifts. *Arif Babul, Bohdan Paczyński, and David Spergel*. **316**, L49, 62-A9 (1987)
 Gamma-Ray Burst Localization by HEAO 3. *R. A. Schwartz, J. C. Ling, W. A. Mahoney, and A. S. Jacobson*. **317**, 846, 75-C7 (1987)
 Gravitational Microlensing and Gamma-Ray Bursts. *Bohdan Paczyński*. **317**, L51, 78-B1 (1987)
 FY Aquilae and the Gamma-Ray Burst Event of 1979 March 31. *Dieter Hartmann and Richard W. Pogge*. **318**, 363, 82-G4 (1987)
 Supernova 1987A in the Large Magellanic Cloud: The Explosion of a $\sim 20 M_\odot$ Star Which Has Experienced Mass Loss? *S. E. Woosley, P. A. Pinto, P. G. Martin, and Thomas A. Weaver*. **318**, 664, 88-B11 (1987)
 A Determination of the $^3\text{He}/\text{H}$ Ratio in the Solar Photosphere from Flare Gamma-Ray Line Observations. *X.-M. Hua and R. E. Lindegfelter*. **319**, 555, 99-C14 (1987)
 The Perseus Flasher and Satellite Glints. *Bradley E. Schaefer, Michael Barber, John J. Brooks, Allen DeForrest, Paul D. Maley, Norman W. McLeod III, Russ McNiel, Andrew J. Noymer, A. K. Presnell, Richard Schwartz, and Scott Whitney*. **320**, 398, 112-D2 (1987)
 Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. *J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Kouveliotou, T. Cline, B. Dennis, U. Desai, and L. Orwig*. **320**, L105, 121-C7 (1987)
 A New Type of Repetitive Behavior in a High-Energy Transient. *J. G. Laros, E. E. Fenimore, R. W. Klebesadel, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, S. R. Kane, C. Kouveliotou, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. **320**, L111, 121-C13 (1987)
 Evidence from Meteor Patrol Photographs for a Nonastronomical Origin of the Reported Optical Flashes in Perseus. *I. Halliday, P. A. Feldman, and A. T. Blackwell*. **320**, L153, 121-F11 (1987)
 SMM Hard X-Ray Observations of the Soft Gamma-Ray Repeater 1806 - 20. *C. Kouveliotou, J. P. Norris, T. L. Cline, B. R. Dennis, U. D. Desai, L. E. Orwig, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, A. V. Kuznetsov, R. A. Sunyaev, and O. V. Terekhov*. **322**, L21, 145-B8 (1987)
 Inverse Comptonization by One-dimensional Relativistic Electrons. *E. Canfield, W. M. Howard, and E. P. Liang*. **323**, 565, 161-A1 (1987)
- Gamma Rays: General**
 Centaurus A Observation at MeV- Gamma-Ray Energies. *P. von Ballmoos, R. Diehl, and V. Schönfelder*. **312**, 134, 2-D11 (1987)

Gamma Rays: General—Continued

- Characteristics of Old Neutron Stars in Dense Interstellar Clouds. *H. Böhringer, G. E. Morfill, and H. U. Zimmermann*. **313**, 218, 17-D1 (1987)
- A Gamma-Ray Constraint on the Nature of Dark Matter. *Joseph Silk and Hans Bloemen*. **313**, L47, 27-B5 (1987)
- Electromagnetic Cascades in the Magnetosphere of a Very Young Pulsar: A Model for the Positron Production near the Galactic Center. *Apostolos Mastichiadis, Kenneth Brecher, and Alan P. Marscher*. **314**, 88, 29-A5 (1987)
- Time-dependent Calculations of X-Ray and γ Reprocessing. *Lynn R. Cominsky, Richard A. London, and Richard I. Klein*. **315**, 162, 41-F14 (1987)
- Positrons from Accelerated Particle Interactions. *B. Kozlousky, R. E. Lingenfelter, and R. Ramaty*. **316**, 801, 60-G6 (1987)
- On the Origin of the Pion-Decay Radiation in the 1982 June 3 Solar Flare. *R. Ramaty, R. J. Murphy, and C. D. Dermer*. **316**, L41, 56-D3 (1987)
- Very High Energy Gamma-Ray Spectroscopy. *David Eichler and James H. Adams, Jr.* **317**, 551, 70-A1 (1987)
- Gamma-Ray Constraints on ^{22}Na Yields in Nova Explosions. *J. C. Higdon and William A. Fowler*. **317**, 710, 73-G2 (1987)
- A New Constraint on the Galactic Plane ^{26}Al Distribution. *C. J. MacCallum, A. F. Hutters, P. D. Stang, and M. Leventhal*. **317**, 877, 75-F1 (1987)
- High-Energy Gamma Rays Probing Cosmic-Ray Spectral Differences throughout the Galaxy. *J. B. G. M. Bloemen*. **317**, L15, 71-B5 (1987)
- Inside Supernova 1987A. *Richard McCray, J. Michael Shull, and Peter Sutherland*. **317**, L73, 78-C7 (1987)
- Map of the Galactic Center Region in the 1.8 MeV ^{26}Al Gamma-Ray Line. *P. von Ballmoos, R. Diehl, and V. Schönfelder*. **318**, 654, 88-B1 (1987)
- Photoerosion of Nuclei in Quasar Emission-Line Regions. *R. N. Boyd and G. J. Ferland*. **318**, L21, 85-B8 (1987)
- Calculated Gamma-Ray Line Fluxes from the Type II Supernova 1987A. *K. W. Chan and R. E. Lingenfelter*. **318**, L51, 92-B12 (1987)
- A Deep Optical Study of the Field of IE 0630 + 178. *G. F. Bignami, P. A. Caraveo, J. A. Paul, L. Salotti, and L. Vigroux*. **319**, 358, 97-A1 (1987)
- Galactic Center Positronium Fraction: Observations and Simulations. *B. L. Brown and M. Leventhal*. **319**, 637, 102-A1 (1987)
- Pair Production and Compton Scattering in Compact Sources and Comparison to Observations of Active Galactic Nuclei. *Alan P. Lightman and Andrzej A. Zdziarski*. **319**, 643, 102-A7 (1987)
- Gamma-Ray Pulsar Model. *Jeffrey M. Cohen and Errol Mustafa*. **319**, 930, 105-B5 (1987)
- Prospects for Observations of Nucleosynthetic Gamma-Ray Lines and Continuum from SN 1987A. *Neil Gehrels, Crawford J. MacCallum, and Marvin Leventhal*. **320**, L19, 114-B10 (1987)
- Gamma-Ray Observations of the Crab Region Using a Coded-Aperture Telescope. *M. L. McConnell, P. P. Dunphy, D. J. Forrest, E. L. Chupp, and A. Owens*. **321**, 543, 128-A13 (1987)
- The Production of ^{26}Al in Supermassive Stars and the Gamma-Ray Line Flux from the Galactic Center. *Wolfgang Hillebrandt, Friedrich-Karl Thielemann, and Norbert Langer*. **321**, 761, 132-G7 (1987)
- Long-Term Gamma-Ray Spectral Variability of Cygnus X-1. *J. C. Ling, W. A. Mahoney, Wm. A. Wheaton, and A. S. Jacobson*. **321**, L117, 137-B8 (1987)
- Prospects for Gamma-Ray Line Observations of Individual Supernovae. *Neil Gehrels, Marvin Leventhal, and Crawford J. MacCallum*. **322**, 215, 140-C3 (1987)
- Inverse Compton Scattering of Ambient Radiation by a Cold Relativistic Jet: A Source of Beamed, Polarized Continuum in Blazars? *Mitchell C. Begelman and Marek Sikora*. **322**, 650, 146-G12 (1987)
- Constraints on Models of Cygnus X-3 from High-Energy Gamma-Ray Absorption at Source. *R. J. Protheroe and Todor Stanev*. **322**, 838, 149-A8 (1987)
- The Directivity of High-Energy Emission from Solar Flares. II. *Solar Maximum Mission* Observations. *W. Thomas Vestrand, D. J. Forrest, E. L. Chupp, E. Rieger, and G. H. Share*. **322**, 1010, 151-A7 (1987)
- Positron Annihilation Gamma Rays from Novae. *Mark D. Leising and Donald D. Clayton*. **323**, 159, 154-G4 (1987)
- Proton-Electron Bremsstrahlung Polarization: Solar Flare X-Ray and Gamma-Ray Polarization. *D. Herischi*. **323**, 391, 157-D2 (1987)
- Positron Annihilation at the Galactic Center. *B. J. Carrigan and J. I. Katz*. **323**, 557, 160-G23 (1987)
- Inverse Comptonization by One-dimensional Relativistic Electrons. *E. Canfield, W. M. Howard, and E. P. Liang*. **323**, 565, 161-A1 (1987)
- Sporadic and Periodic 10–1000 TeV Gamma Rays From Cygnus X-3. *R. M. Baltrusaitis, G. L. Cassiday, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebhe, C. P. Lingle, E. C. Loh, P. Sokolsky, P. Sommers, and D. Steck*. **323**, 685, 162-C1 (1987)
- On the Relationship of Flare Size and Particle Anisotropy in Solar Gamma-Ray Flares. *Charles D. Dermer*. **323**, 795, 163-D10 (1987)
- High-Energy Processes in Solar Flares. *R. J. Murphy, C. D. Dermer, and R. Ramaty*. **63**, 721, 11-D13 (1987) (Abstr. in **313**, 931, 26-G14)
- Gravitation**
- The Quadrupole Gravitational Lens. *Israel Kover*. **312**, 22, 1-B14 (1987)
- Non-Newtonian Forces and the Invisible Mass Problem. *J. R. Kuhn and L. Kruglyak*. **313**, 1, 15-A7 (1987)
- The Intensity Ratio in Different Wave Bands between Images of Gravitationally Lensed Quasars as a Probe of Dark Matter. *Kandaswamy Subramanian and S. M. Chitre*. **313**, 13, 15-B5 (1987)
- 1146 + 1118C: A Giant Gravitational Lens? *R. D. Blandford, E. S. Phinney, and R. Narayan*. **313**, 28, 15-C6 (1987)
- Remarks on the Necessity and Uniqueness of the Gravitational Stress-Energy Pseudotensor. *Thomas W. Noonan*. **313**, 37, 15-D1 (1987)
- Hypercharge, Solar Structure, and Stellar Evolution. *Ronald L. Gilliland and Werner Däppen*. **313**, 429, 19-F7 (1987)
- Light-Element Yields with Cosmological Decaying Gravitinos. *R. Dominguez-Tenreiro*. **313**, 523, 22-E1 (1987)
- On Gravitational Oscillations. *Jeremy Goodman*. **313**, 576, 23-B1 (1987)
- Amplification and Polarization of Supernovae by Gravitational Lensing. *P. Schneider and Robert V. Wagoner*. **314**, 154, 29-F2 (1987)
- Multipole Anisotropies of the Cosmic Background Radiation and Inflationary Models. *R. Fabbri, F. Lucchin, and S. Matarrese*. **315**, 1, 40-A7 (1987)
- The Gravitational Lens System 2016 + 112 Revisited. *D. Narasimha, K. Subramanian, and S. M. Chitre*. **315**, 434, 45-D11 (1987)
- Electron Scintillation in Gravitationally Lensed Images of Astrophysical Radio Sources. *Shuji Deguchi and William D. Watson*. **315**, 440, 45-E4 (1987)
- X-Ray-Selected AGNs near Bright Galaxies. *John T. Stocke, Peter Schneider, Simon L. Morris, Isabella M. Gioia, Tommaso Maccacaro, and Rudolph E. Schild*. **315**, L11, 45-A14 (1987)
- Gravitational Lenses and Decay of Dark Matter. *Avishai Dekel and Tsvi Piran*. **315**, L83, 49-B6 (1987)
- The Thick Gravitational Lens: A Lens Composed of Many Elements at Different Distances. *Israel Kover*. **316**, 52, 50-E10 (1987)
- The Amplification Bias by Gravitational Lensing on Observed Number Counts of Quasars: Effects of a Finite Source Size. *Peter Schneider*. **316**, L7, 56-A10 (1987)
- Gravitational Lensing by an Ensemble of Isothermal Galaxies. *Neal Katz and Bohdan Paczyński*. **317**, 11, 64-B3 (1987)
- Gravitational Microlensing and Gamma-Ray Bursts. *Bohdan Paczyński*. **317**, L51, 78-B1 (1987)
- Inhomogeneous Cosmology. III. Primordial Gravitational Waves and Dust. *P. J. Adams, R. W. Hellings, and R. L. Zimmerman*. **318**, 1, 79-A5 (1987)
- Gravity in One Dimension: Selective Relaxation? *Charles J. Reidl, Jr. and Bruce N. Miller*. **318**, 248, 81-E10 (1987)
- Why Coronal Loops Cannot Exist without Solar Gravity. *I. J. D. Craig and A. N. McClymont*. **318**, 421, 83-E5 (1987)
- A Search for Sinusoidal Gravitational Radiation in the Period Range 30–2000 Seconds. *J. W. Armstrong, F. B. Estabrook, and H. D. Wahlquist*. **318**, 536, 86-F8 (1987)
- Simulations of Axisymmetric, Newtonian Star Clusters: Prelude to 2 + 1 General Relativistic Computations. *Stuart L. Shapiro and Saul A. Teukolsky*. **318**, 542, 86-G1 (1987)
- Extraction of Cosmological Information from Multiimage Gravitational Lenses. *Israel Kover*. **318**, L1, 85-A4 (1987)
- The Formation of Families of Twin Galaxies by String Loops. *Lennox L. Cowie and Esther M. Hu*. **318**, L33, 92-A9 (1987)
- An Analytically Soluble Problem in Fully Nonlinear Statistical Gravitational Lensing. *P. Schneider*. **319**, 9, 93-B1 (1987)
- How Big Are Supermassive Black Holes Formed from the Collapse of Dense Star Clusters? *Christopher S. Kochanek, Stuart L. Shapiro, and Saul A. Teukolsky*. **320**, 73, 108-G8 (1987)
- Gravitational Lensing by Isothermal Spheres with Finite Core Radii: Galaxies and Dark Matter. *Gary Hinshaw and Lawrence M. Krauss*. **320**, 468, 114-E7 (1987)
- Probing Gravity to the Second Post-Newtonian Order and to One Part in 10^7 Using the Spin Axis of the Sun. *Ken Nordvedt*. **320**, 871, 119-C12 (1987)
- 4U 1820 – 30 as a Potential Test of the Nonsymmetric Gravitational Theory of Moffat. *Timothy P. Krisher*. **320**, L47, 114-D8 (1987)
- Gravitational Imaging by Isolated Elliptical Potential Wells. I. Cross Sections. *Roger D. Blandford and Christopher S. Kochanek*. **321**, 658,

- 131-F1 (1987)
 Gravitational Imaging by Isolated Elliptical Potential Wells. II. Probability Distributions. *Christopher S. Kochanek and Roger D. Blandford*. **321**, 676, 132-A3 (1987)
 The Marginal Gravitational Lensing. *Israel Kover*. **321**, 686, 132-A13 (1987)
 The Triple Radio Source 0023 + 171: A Candidate for a Dark Gravitational Lens. *J. N. Hewitt, E. L. Turner, C. R. Lawrence, D. P. Schneider, J. E. Gunn, C. L. Bennett, B. F. Burke, J. H. Mahoney, G. I. Langston, M. Schmidt, J. B. Oke, and J. G. Hoessel*. **321**, 706, 132-C5 (1987)
 Discovery of a Probable Binary Quasar. *S. Djorgovski, R. Perley, G. Meylan, and P. McCarthy*. **321**, L17, 129-C6 (1987)
 Concerning the Limit on the Mean Mass Distribution of Galaxies from Their Gravitational Lens Effect. *Israel Kover and Mordehai Milgrom*. **321**, L113, 137-B5 (1987)
 A Possible Semisecular Variation in Orbital Period of Binary Pulsar System PSR 1913 + 16 and Lorentz Invariance of Gravity. *K. Nordvedt, Jr.* **322**, 288, 141-A6 (1987)
 Gravitational Redshift and Mass-Radius Relation in White Dwarfs. *D. Koester*. **322**, 852, 149-B8 (1987)
 Degenerate Dwarf Binaries as Promising, Detectable Sources of Gravitational Radiation. *Charles R. Evans, Icko Iben, Jr., and Larry Smarr*. **323**, 129, 154-E1 (1987)
 Extraction of Cosmological Information from Multiimage Gravitational Lenses: Erratum. *Israel Kover*. **323**, L155, 164-E13 (1987) (Orig. paper in **318**, L1, 85-A4)
Gravitational Lenses
 Concerning the Limit on the Mean Mass Distribution of Galaxies from Their Gravitational Lens Effect. *Israel Kover and Mordehai Milgrom*. **321**, L113, 137-B5 (1987)
Hydrodynamics
 Gas Clouds in Galactic Bulges. *William G. Mathews and Stephen D. Murray*. **312**, 66, 1-F12 (1987)
 Fast Downflows in the Solar Transition Region Explained. *A. N. McClymont and I. J. D. Craig*. **312**, 402, 5-C2 (1987)
 The Growth of Linear Perturbations of Adiabatic Shock Waves. *Dongsu Ryu and Ethan T. Vishniac*. **313**, 820, 25-F8 (1987)
 Jet Collimation by Turbulent Viscosity. *I. R. N. Henriksen*. **314**, 33, 28-D1 (1987)
 A Variational Principle for Determining the Oscillations and Stability of Stellar Systems. *John Everson*. **314**, 47, 28-E1 (1987)
 The Effect of Viscosity on Neutron Star Oscillations. *Curt Cutler and Lee Lindblom*. **314**, 234, 30-F4 (1987)
 Hydrostatic Confinement of Radio Jets. *Kayll Lake and Patrick Boucher*. **314**, 507, 34-B2 (1987)
 Nonlinear Evolution of Radiation-driven Thermally Unstable Fluids. *R. B. Dahlburg, C. R. DeVore, J. M. Picone, J. T. Mariska, and J. T. Karpen*. **315**, 385, 44-B5 (1987)
 Numerical Simulations of Adiabatic Axisymmetric Accretion Flow. I. A New Mechanism for the Formation of Jets. *B. A. Fryxell, Ronald E. Taam, and S. L. W. McMillan*. **315**, 536, 46-E5 (1987)
 The Evolution of Active Galactic Nuclei. II. Models with Stellar Evolution. *Laurence P. David, Richard H. Durisen, and Haldan N. Cohn*. **316**, 505, 57-E4 (1987)
 Gasdynamical Stripping of Elliptical Galaxies. *T. J. Gaetz, E. E. Salpeter, and G. Shaviv*. **316**, 530, 57-G3 (1987)
 Bipolar Flows, Molecular Gas Disks, and the Collapse and Accretion of Rotating Interstellar Clouds. *Alan P. Boss*. **316**, 721, 60-A6 (1987)
 Models for Type Ia Supernovae with Composition Inversions. *J. Craig Wheeler, Douglas Swartz, Zong-wei Li, and Peter G. Sutherland*. **316**, 733, 60-B5 (1987)
 An Instability of Radiative Acceleration. *J. I. Katz*. **317**, 264, 66-G3 (1987)
 A Fluid Model for the Evolution of Large-Scale Structure. *P. J. E. Peebles*. **317**, 576, 72-D8 (1987)
 The Structure of Time-dependent Interstellar Shocks and Grain Destruction in the Interstellar Medium. *Christopher F. McKee, David J. Hollenbach, C. Gregory Seab, and A. G. G. M. Tielens*. **318**, 674, 88-C7 (1987)
 Convection and the Mechanism of Type II Supernovae. *Adam Burrows*. **318**, L57, 92-C3 (1987)
 Protostellar Formation in Rotating Interstellar Clouds. VI. Nonuniform Initial Conditions. *Alan P. Boss*. **319**, 149, 94-F2 (1987)
 Helicity Conservation Laws for Fluids and Plasmas. *Jacob D. Bekenstein*. **319**, 207, 95-C4 (1987)
 Hydrodynamical Constraints on Cosmic-Ray Acceleration in Relativistic Shocks. *G. M. Webb*. **319**, 215, 95-C12 (1987)
 Application of Time-dependent Fourier Analysis to Nonlinear Pulsational Stellar Models. *G. Kovács, J. R. Buchler, and C. G. Davis*. **319**, 247, 95-F6 (1987)
 Formation of Stellar Shells and X-Ray Coronae around Elliptical Galaxies. *Masayuki Umemura and Satoru Ikeuchi*. **319**, 601, 101-E5 (1987)
 Collapse of 9 M_{\odot} Stars. *E. Baron, J. Cooperstein, and S. Kahana*. **320**, 300, 111-D1 (1987)
 Collapsing White Dwarfs. *E. Baron, J. Cooperstein, S. Kahana, and K. Nomoto*. **320**, 304, 111-D5 (1987)
 On Entropy and Stellar Systems. *Herwig Dejonghe*. **320**, 477, 114-F3 (1987)
 Period Doubling Bifurcations and Chaos in W Virginis Models. *J. Robert Buchler and Géza Kovács*. **320**, L57, 114-E3 (1987)
 The Effect of a Quasi-stellar Object on Its Host Galaxy: Dynamical and Physical Processes in the Interstellar Medium around a Quasi-stellar Object. *C. A. Chang, A. V. R. Schiano, and A. M. Wolfe*. **322**, 180, 139-G8 (1987)
 Radio Recombination Lines from Fast Shocks in Molecular Clouds, with Application to Bipolar Flows. *Christopher F. McKee and David J. Hollenbach*. **322**, 275, 140-G7 (1987)
 The Crucial Role of Cooling in the Making of Molecular Clouds and Stars. *Joel E. Tohline, Peter H. Bodenheimer, and Dimitris M. Christodoulou*. **322**, 787, 148-D9 (1987)
 On Synchronization in Early-Type Binaries. *Jean-Louis Tassoul*. **322**, 856, 149-B12 (1987)
 The Thermodynamics of Anisotropic Radiating Systems. *Albert Fu*. **323**, 211, 155-D1 (1987)
 Physical Constraints on Variable Eddington Factors for the Gray Problem in Radiative Transfer. *Albert Fu*. **323**, 227, 155-E3 (1987)
 Cerenkov Damping of Surface Waves. *Altair S. Assis and J. Busnardo-Neto*. **323**, 399, 157-D10 (1987)
 Three-dimensional Hydrodynamical Simulations of Stellar Collisions. I. Equal-Mass Main-Sequence Stars. *W. Benz and J. G. Hills*. **323**, 614, 161-D9 (1987)
 A New Example of the Papaloizou-Pringle Instability. *M. A. Abramowicz, O. M. Blaes, and P. Ghosh*. **323**, 629, 161-E10 (1987)
 Radiation-Hydrodynamic Calculation of Sub-Eddington Accretion Disks. *G. E. Eggum, F. V. Coroniti, and J. I. Katz*. **323**, 634, 161-F1 (1987)
Hydromagnetics
 Magnetohydrodynamic Shocks in Molecular Clouds. *David F. Chernoff*. **312**, 143, 2-E6 (1987)
 Formation of a Solar Coronal Transient with Forerunner. *Erast B. Gliner and Vladimir A. Osherovich*. **312**, 412, 5-C12 (1987)
 The Formation of Current Sheets in the Solar Atmosphere. *Ellen G. Zweibel and He-Sheng Li*. **312**, 423, 5-D9 (1987)
 Static Current-Sheet Models of Quiescent Prominences. *F. Wu and B. C. Low*. **312**, 431, 5-E3 (1987)
 Propagation of Compressive Waves through Fibril Magnetic Fields. *T. J. Bogdan and Ellen G. Zweibel*. **312**, 444, 5-F10 (1987)
 Supercloud Formation by Nonaxisymmetric Gravitational Instabilities in Sheared Magnetic Galaxy Disks. *Bruce G. Elmegreen*. **312**, 626, 9-F10 (1987)
 Nonadiabatic Gravitational Collapse. *A. K. G. de Oliveira and N. O. Santos*. **312**, 640, 10-A1 (1987)
 The Dynamical Oscillation and Propulsion of Magnetic Fields in the Convective Zone of a Star. I. General Considerations. *E. N. Parker*. **312**, 868, 12-D6 (1987)
 Resonance Absorption of Magnetohydrodynamic Surface Waves: Physical Discussion. *Joseph V. Holweg*. **312**, 880, 12-E4 (1987)
 The Topology of Force-Free Magnetic Fields and Its Implications for Coronal Activity. *Spiro K. Antiiochos*. **312**, 886, 12-E10 (1987)
 Hydrodynamic Flare Modeling: Comparison of Numerical Calculations with SMM Observations of the 1980 November 12 17:00 UT Flare. *G. Peres, F. Reale, S. Serio, and R. Pallavicini*. **312**, 895, 12-F5 (1987)
 Current-driven Magnetohydrodynamic Thermal Instabilities in Sheared Fields. *G. Bodo, A. Ferrari, S. Massaglia, and R. Rosner*. **313**, 432, 19-F10 (1987)
 Nonstochastic Prompt Proton Acceleration by Fast Magnetosonic Shocks in the Solar Plasma. *Yukiharu Ohsawa and Jun-ichi Sakai*. **313**, 440, 19-G4 (1987)
 Spatial Stability of Jets: The Nonaxisymmetric Fundamental and Reflection Modes. *Philip E. Hardee*. **313**, 607, 23-D6 (1987)
 Beam Models for Radio Sources. VI. Evolution of Magnetized Jets in Power-Law Potentials. *M. Javad Siah and Paul J. Witta*. **313**, 623, 23-E8 (1987)
 The Effects of Dust on the Propagation and Dissipation of Alfvén Waves in Interstellar Clouds. *W. Pilipp, T. W. Hartquist, O. Havnes, and G. E. Morfill*. **314**, 341, 37-G9 (1987)

Hydromagnetics—Continued

- Theoretical Non-Maxwellian Particle Velocity Distribution Functions for Spherically Symmetric Solar Wind-like Plasma Systems and Consequences. II. The Case of Large Thermal Anisotropy and Nine Moments Description for Each Species. *S. Cupperman, H. Yatani, M. Dryer, and D. Lewis.* **314**, 404, 32-E11 (1987)
- A Computational Code for Two-dimensional Unsteady Magnetohydrodynamics by the Method of Characteristics. *Y. Q. Lou, R. Rosner, and P. Ulmschneider.* **315**, 349, 43-F6 (1987)
- On the Generation of Magnetohydrodynamic Waves in a Stratified and Magnetized Fluid. I. Vertical Propagation. *Z. E. Musielak and R. Rosner.* **315**, 371, 44-A5 (1987)
- Self-collimated Electromagnetic Jets from Magnetized Accretion Disks. *R. V. E. Lovelace, J. C. L. Wang, and M. E. Sulkanen.* **315**, 504, 46-C1 (1987)
- Magnetic Helicity of the Parker Field. *J. W. Bieber, P. A. Evenson, and W. H. Matthaeus.* **315**, 700, 48-C7 (1987)
- Magnetohydrodynamic Cosmologies with a Bertotti-Robinson-like Limit. *R. Portugal and I. Damiao Soares.* **316**, 483, 57-C9 (1987)
- Pulsar Magnetogyro Ratios and Pulsar Evolution. IV. Peaks in the Pulse Period Number Density Distribution and Short-Period Evolution. *James F. Woodward.* **316**, 743, 60-C1 (1987)
- The Influence of the Coriolis Force on Flux Tubes Rising through the Solar Convection Zone. *Arbab Rai Choudhuri and Peter A. Gilman.* **316**, 788, 60-F7 (1987)
- Hydromagnetic Constraints on Deep Zonal Flow in the Giant Planets. *R. L. Kirk and D. J. Stevenson.* **316**, 836, 61-C4 (1987)
- Explosive Evaporation in Solar Flares. *George H. Fisher.* **317**, 502, 69-D6 (1987)
- Heating of the Solar Corona by the Resonant Absorption of Alfvén Waves. *Joseph M. Davila.* **317**, 514, 69-E4 (1987)
- The Structure and Dissipation of Forced Current Sheets in the Solar Atmosphere. *Tzihong Chiueh and Ellen G. Zweibel.* **317**, 900, 76-A7 (1987)
- Incompressible Magnetohydrodynamic Surface Waves: Nonlinear Aspects. *Joseph V. Hollweg.* **317**, 918, 76-B11 (1987)
- Nonlinear Radiative Condensation in a Sheared Magnetic Field. *G. Van Hoven, L. Sparks, and D. D. Schnack.* **317**, L91, 78-D9 (1987)
- The Evolution of Cooling Flows. I. Self-similar Cluster Flows. *Roger A. Chevalier.* **318**, 66, 79-E14 (1987)
- Spatial Stability of Relativistic Jets: Application to 3C 345. *Philip E. Hardee.* **318**, 78, 79-F12 (1987)
- Why Coronal Loops Cannot Exist without Solar Gravity. *I. J. D. Craig and A. N. McClymont.* **318**, 421, 83-E5 (1987)
- On Magnetohydrodynamic Solitons in Jets. *B. Roberts.* **318**, 590, 87-D1 (1987)
- Magnetic Reorientation and the Spontaneous Formation of Tangential Discontinuities in Deformed Magnetic Fields. *E. N. Parker.* **318**, 876, 90-E6 (1987)
- Propagation of Compressive Waves through Fibril Magnetic Fields. II. Scattering from a Slab of Magnetic Flux Tubes. *T. J. Bogdan.* **318**, 888, 90-F4 (1987)
- Propagation of Compressive Waves through Fibril Magnetic Fields. III. Waves that Propagate along the Magnetic Field. *T. J. Bogdan.* **318**, 896, 90-F12 (1987)
- Helicity Conservation Laws for Fluids and Plasmas. *Jacob D. Bekenstein.* **319**, 207, 95-C4 (1987)
- Solar Transition Region and Coronal Response to Heating Rate Perturbations. *John T. Mariska.* **319**, 465, 98-C3 (1987)
- A Simulation of High-Energy Cosmic-Ray Propagation. *M. Honda.* **319**, 836, 104-B7 (1987)
- Magnetohydrodynamic Modeling of Coronal Bright Points. *W. L. Waldron and D. J. Mullan.* **319**, 971, 105-E5 (1987)
- On Two-Stream Instability in Pulsar Magnetospheres. *V. V. Usos.* **320**, 333, 111-F6 (1987)
- A Numerical Study of the Nonlinear Thermal Stability of Solar Loops. *J. A. Klimchuk, S. K. Antiochos, and J. T. Mariska.* **320**, 409, 112-D13 (1987)
- Stability of Current-Sheet Models of Quiescent Prominences and Equatorial Disks. *F. Wu.* **320**, 418, 112-E8 (1987)
- Magnetic Braking in Weakly Ionized Media. *Arieh Königl.* **320**, 726, 117-F6 (1987)
- Reconnection-driven Oscillations in Dwarf Novae Disks. *T. Tajima and D. Gilden.* **320**, 741, 117-G10 (1987)
- Resonance Absorption of Magnetohydrodynamic Surface Waves: Viscous Effects. *Joseph V. Hollweg.* **320**, 875, 119-D2 (1987)
- The Interaction of Solar p -Modes with a Sunspot. II. Simple Theoretical Models. *Toufik E. Abdelatif and John H. Thomas.* **320**, 884, 119-D11 (1987)
- Nonlocal Thermal Transport in Solar Flares. *Judith T. Karpen and C. Richard DeVore.* **320**, 904, 119-F3 (1987)
- Oblique Magnetohydrodynamic Shock Waves in Molecular Clouds. *Mark Wardle and B. T. Draine.* **321**, 321, 125-F8 (1987)
- Shocked Relativistic Magnetohydrodynamic Flows with Application to Pulsar Winds. *Robert T. Emmerring and Roger A. Chevalier.* **321**, 334, 125-G10 (1987)
- Magnetic Monopole Plasma Oscillations and the Survival of Galactic Magnetic Fields. *E. N. Parker.* **321**, 349, 126-A11 (1987)
- The Dynamical Oscillation and Propulsion of Magnetic Fields in the Convective Zone of a Star. II. Thermal Shadows. *E. N. Parker.* **321**, 984, 135-C6 (1987)
- The Dynamical Oscillation and Propulsion of Magnetic Fields in the Convective Zone of a Star. III. Accumulation of Heat and the Onset of the Rayleigh-Taylor Instability. *E. N. Parker.* **321**, 1009, 135-E3 (1987)
- Current Loop Coalescence Model of Solar Flares. *T. Tajima, J. Sakai, H. Nakajima, T. Kosugi, F. Brunel, and M. R. Kundu.* **321**, 1031, 135-F11 (1987)
- Wave Energy in White Dwarf Atmospheres. I. Magnetohydrodynamic Energy Spectra for Homogeneous DB and Layered DA Stars. *Zdzislaw E. Musielak.* **322**, 234, 140-D8 (1987)
- The Scattering of Alfvén Waves by Density Fluctuations. *He-Sheng Li and Ellen G. Zweibel.* **322**, 248, 140-E8 (1987)
- Particle Acceleration at Shocks: A Monte Carlo Method. *J. G. Kirk and P. Schneider.* **322**, 256, 140-F2 (1987)
- The Polarization Properties of Model Sunspots: The Broad-Band Polarization Signature of the Schlüter-Temesvary Representation. *A. Skumanich and B. W. Lites.* **322**, 483, 143-C4 (1987)
- Heating of Coronal Loops by Phase-mixed Shear Alfvén Waves. *Toufik E. Abdelatif.* **322**, 494, 143-D1 (1987)
- Energy Buildup in Coronal Magnetic Flux Tubes. *R. S. Steinolfson and T. Tajima.* **322**, 503, 143-D10 (1987)
- On Stable Hydrostatic Equilibrium Configurations of the Galaxy and Implications for Its Halo. *J. B. G. M. Bloemen.* **322**, 694, 147-D1 (1987)
- A Pulsar Emission Model: Observational Tests. *F. Curtis Michel.* **322**, 822, 148-G2 (1987)
- Nonlinear Magnetohydrodynamic Waves in a Steady Zonal Circulation for a Shallow Fluid Shell on the Surface of a Rotating Sphere. *Y. Q. Lou.* **322**, 862, 149-C4 (1987)
- On the Controversy Concerning Turbulent Bremsstrahlung. *D. B. Melrose and J. Kuijpers.* **323**, 338, 156-F7 (1987)
- On Pumping the Strong Water Maser Sources. *Nikolaos D. Kylafis and Colin Norman.* **323**, 346, 156-G1 (1987)
- Electric Current Sheet Formation in a Magnetic Field Induced by Continuous Magnetic Footpoint Displacements. *B. C. Low.* **323**, 358, 157-A1 (1987)
- Cosmic-Ray-modified Stellar Winds. I. Solution Topologies and Singularities. *C. M. Ko and G. M. Webb.* **323**, 657, 162-A1 (1987)

Infrared: General

- Detection of CO(1 \rightarrow 0) Emission and Optical Imaging of the Seyfert Galaxy/QSO Markarian 231. *D. B. Sanders, J. S. Young, N. Z. Scoville, B. T. Soifer, and G. E. Danielson.* **312**, L5, 7-A8 (1987)
- Direct Infrared Imaging of VB 8. *M. F. Skrutskie, W. J. Forrest, and M. A. Shure.* **312**, L55, 14-C11 (1987)
- Evidence of an Infrared Luminosity Indicator for Galaxies. *Eric D. Feigelson, Takashi Ito, and Daniel W. Weedman.* **319**, L51, 107-C4 (1987)
- M Giants in Baade's Window: Infrared Colors, Luminosities, and Implications for the Stellar Content of E and S0 Galaxies. *Jay A. Frogel and A. E. Whitford.* **320**, 199, 110-C10 (1987)
- The IRAS Bright Galaxy Sample. II. The Sample and Luminosity Function. *B. T. Soifer, D. B. Sanders, B. F. Madore, G. Neugebauer, G. E. Danielson, J. H. Elias, Carol J. Lonsdale, and W. L. Rice.* **320**, 238, 110-F7 (1987)
- Distance Moduli and Structure of the Magellanic Clouds from Near-Infrared Photometry of Classical Cepheids. *Douglas L. Welch, Robert A. McLaren, Barry F. Madore, and Christopher W. McAlary.* **321**, 162, 124-A7 (1987)

Infrared: Sources

- Narrow-Line Seyfert Galaxies with Permitted Fe II Emission: Markarian 507, 5C 3.100, and I Zwicky 1. *J. P. Halpern and J. B. Oke.* **312**, 91, 2-A9 (1987)
- Emission from CO Band Heads in Young Stellar Objects. *T. R. Geballe and S. E. Persson.* **312**, 297, 4-B8 (1987)
- Ground-based Observations of IRAS Candidates for Late Asymptotic Giant Branch Stars. *Sun Kwok, Bruce J. Hrivnak, and R. T. Boreiko.* **312**, 303, 4-B14 (1987)
- Observations of Infrared Emission from a Fast-moving Knot in Cassiopeia A. *Harriet L. Dinerstein, Daniel F. Lester, David M. Rank,*

- Michael W. Werner, and Diane H. Wooden. **312**, 314, 4-C11 (1987)
- Molecular Clouds in the Outer Galaxy. I. Far-Infrared Observations. Kathryn N. Mead, Marc L. Kutner, Neal J. Evans II, Paul M. Harvey, and Bruce A. Wilking. **312**, 321, 4-D4 (1987)
- Infrared Characteristics of the Nuclei of Normal Galaxies. Nicholas A. Devereux, E. E. Becklin, and Nick Scoville. **312**, 529, 8-F3 (1987)
- Structure in the Nucleus of NGC 1068 at 10 Microns. R. Tresch-Fienberg, G. G. Fazio, D. Y. Gezari, W. F. Hoffmann, G. M. Lamb, P. K. Shu, and C. R. McCreight. **312**, 542, 8-G2 (1987)
- Star Formation in Seyfert Galaxies. J. M. Rodriguez Espinosa, Richard J. Rudy, and Barbara Jones. **312**, 555, 9-A1 (1987)
- Star Formation Rates in Ring Galaxies from IRAS Observations. P. N. Appleton and Curtis Struck-Marcell. **312**, 566, 9-A12 (1987)
- IRAS Large-Beam and Ground-Based Small-Beam Measurements of the Unidentified 11.3 and [Ne II] 12.8 Micron Line Fluxes in the Starburst Galaxy M82. P. D. LeVan and S. D. Price. **312**, 592, 9-D1 (1987)
- Spectral Evolution of Young Stellar Objects. Fred C. Adams, Charles J. Lada, and Frank H. Shu. **312**, 788, 11-E3 (1987)
- An Eight-Year Spectroscopic Orbit for the WC7 + O4 Wolf-Rayet Binary HD 193793: Toward Solving the Mystery of the Infrared Outbursts. Anthony F. Moffat, Robert Lamontagne, Peredur M. Williams, Jiri Horn, and Wilhelm Seggewiss. **312**, 807, 11-F8 (1987)
- The Dust Shells of NML Cygnus and IRC 10420: Inner Radius, Temperature, and Optical Thickness: Erratum. Stephen T. Ridgway, Richard R. Joyce, Dennis Connors, Judith L. Pipher, and Christopher Dainty. **312**, 963, 13-E1 (1987) (Orig. paper in **302**, 662, 37-G8)
- Interstellar Dust in Soapley-Ames Elliptical Galaxies. M. Jura, D. W. Kim, G. R. Knapp, and P. Guhathakurta. **312**, L11, 7-A13 (1987)
- On the Binary Nature of Van Biesbroeck 8. C. Perrier and J.-M. Mariotti. **312**, L27, 7-B12 (1987)
- Gamma-Ray Burst Counterparts: Infrared. Bradley E. Schaefer, T. L. Cline, U. Desai, B. J. Teegarden, J.-L. Atteia, C. Barat, K. Hurley, M. Niel, W. D. Evans, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, I. V. Estulin, and A. V. Kuznetsov. **312**, 226, 17-D9 (1987)
- Pumping the Stellar Hydroxyl Maser. Dale F. Dickinson. **313**, 408, 19-D13 (1987)
- A Model for the Emission from the Bulge of Our Galaxy. M. Rowan-Robinson and T. Chester. **313**, 413, 19-E4 (1987)
- IRAS Surface Brightness Maps of Reflection Nebulae in the Pleiades. Michael W. Castelaz, K. Sellgren, and M. W. Werner. **313**, 853, 26-B1 (1987)
- Submillimeter Diagnostics of the Response of the Solar Chromosphere to Compressional Waves. C. Lindsey and T. Roellig. **313**, 877, 26-D1 (1987)
- 1300 Micron Continuum Observations of the Sagittarius B2 Molecular Cloud Core. Paul F. Goldsmith, Ronald L. Snell, and Dariusz C. Lis. **313**, L5, 21-A8 (1987)
- IRAS 00521 - 7054: An Unusually Warm Galaxy. Jay A. Frogel and J. H. Elias. **313**, L53, 27-B10 (1987)
- Dust Reradiation from M43. J. Smith, D. A. Harper, and R. F. Loewenstein. **314**, 76, 28-G7 (1987)
- Observation of the HH 1 and 2 Region with IRAS. Steven H. Pravdo and Thomas J. Chester. **314**, 308, 31-D13 (1987)
- The Discovery of an Infrared Reflection Nebula Surrounding R Coronae Australis IRS 5. Michael W. Castelaz and John A. Hackwell. **314**, 317, 31-E9 (1987)
- On the Origin of the 40-120 Micron Emission of Galaxy Disks: A Comparison with H α Fluxes. Carol J. Lonsdale Persson and George Helou. **314**, 513, 35-B8 (1987)
- An IRAS Survey of IR Excesses in G-Type Stars. Sten F. Odenwald. **314**, 830, 38-F2 (1987) (Orig. paper in **307**, 711, 104-F6)
- The Large-Scale Anisotropies of the Extragalactic Infrared Background. R. Fabbri, P. Andreani, F. Melchiorri, and B. Nisini. **315**, 12, 40-B4 (1987)
- The Most Luminous Far-Infrared Extragalactic Sources. M. Harwit, J. R. Houck, B. T. Soifer, and G. G. C. Palumbo. **315**, 28, 40-C6 (1987)
- The Continuum of Type I Seyfert Galaxies. I. A Single Form Modified by the Effects of Dust. Martin Ward, Martin Elvis, G. Fabbiano, N. P. Carleton, S. P. Willner, and A. Lawrence. **315**, 74, 40-F12 (1987)
- Infrared Speckle Interferometry and Imaging of Several OH/IR Stars. Michael L. Cobb and John D. Fix. **315**, 325, 43-D10 (1987)
- On the Contribution of Interstellar Extinction to the 10 Micron Dust Feature in OH/IR Stars. Kevin Volk and Sun Kwok. **315**, 654, 47-G1 (1987)
- A Seyfert Nucleus of a New Ring Galaxy in Sextans. Ken-ichi Wakamatsu and Mitsugu T. Nishida. **315**, L23, 45-B12 (1987)
- IRAS Observations of Starburst and Nonactive Spiral Galaxies. Kazuhiro Sekiguchi. **316**, 145, 51-E6 (1987)
- Warm Dense Gas in Luminous Protostellar Regions: A Submillimeter and Far-Infrared CO Line Study. D. T. Jaffe, A. I. Harris, and R. Genzel. **316**, 231, 52-E1 (1987)
- Infrared Line Observations of Low-Luminosity Outflow Sources. Howard A. Smith, J. Fischer, T. R. Geballe, and P. R. Schwartz. **316**, 265, 52-G12 (1987)
- IRAS Observations of the Exciting Stars of Herbig-Haro Objects. Martin Cohen and Richard D. Schwartz. **316**, 311, 53-D3 (1987)
- IRAS 23060 + 0505: A Highly Obscured $3.3 \times 10^{12} L_{\odot}$ Active Galaxy. G. J. Hill, C. G. Wynn-Williams, and E. E. Becklin. **316**, L11, 56-A14 (1987)
- A Very Deep IRAS Survey: Constraints on the Evolution of Starburst Galaxies. Perry Hacking, J. J. Condon, and J. R. Houck. **316**, L15, 56-B4 (1987)
- Far-Infrared Detection of a Circumstellar Dust Torus around Sharpless 106. Paul M. Harvey, Daniel F. Lester, and Marshall Joy. **316**, L75, 62-C5 (1987)
- A Near-Infrared Study of the NGC 6334-IV Region. P. M. Harvey, A. R. Hyland, and S. M. Straw. **317**, 173, 65-G8 (1987)
- Star Formation in the Magellanic Irregular Galaxy NGC 4449. Harley A. Thronson, Jr., Deidre A. Hunter, C. M. Telesco, D. A. Harper, and R. Decher. **317**, 180, 66-A3 (1987)
- Inside Supernova 1987A. Richard McCray, J. Michael Shull, and Peter Sutherland. **317**, L73, 78-C7 (1987)
- A Study of a Flux-limited Sample of IRAS Galaxies. Beverly J. Smith, S. G. Kleinmann, J. P. Huchra, and F. J. Low. **318**, 161, 80-F5 (1987)
- Luminosity Dependence in the Ratio of X-Ray to Infrared Emission of QSOs. D. M. Worrall. **318**, 188, 81-A4 (1987)
- Observations of 1.3 Millimeter Emission from the Centers of Galaxies. Harley A. Thronson, Jr., Christopher K. Walker, Constance E. Walker, and Philip Maloney. **318**, 645, 88-A4 (1987)
- Hydrodynamical Processes in the Draco Molecular Cloud. Sten F. Odenwald and Lee J. Rickard. **318**, 702, 88-E7 (1987)
- A Hot, Low Mass-Loss Rate Inner Envelope in IRC +10216. R. Sahai. **318**, 809, 89-F11 (1987)
- IRAS Observations of Collisionally Heated Dust in Large Magellanic Cloud Supernova Remnants. James R. Graham, A. Evans, J. S. Albinson, M. F. Bode, and W. P. S. Meikle. **319**, 126, 94-D5 (1987)
- Infrared Emission from Young Stars in the Nucleus of M82. Marshall Joy, Daniel F. Lester, and Paul M. Harvey. **319**, 314, 96-D5 (1987)
- Near-Infrared and Optical Observations of IRAS Sources in and near Dense Cores. P. C. Myers, Gary A. Fuller, R. D. Mathieu, C. A. Beichman, P. J. Benson, R. E. Schild, and J. P. Emerson. **319**, 340, 96-F5 (1987)
- Molecular and Atomic Clouds Associated with Infrared Cirrus in Ursa Major. Hendrik Willem de Vries, Andreas Heithausen, and Patrick Thaddeus. **319**, 723, 103-A1 (1987)
- Direct Infrared Observations of the Very Low Mass Object Gliese 623B. D. W. McCarthy, Jr. and T. J. Henry. **319**, L93, 107-F3 (1987)
- A Search for Brown Dwarfs and Late M Dwarfs in the Hyades and the Pleiades. B. Zuckerman and E. E. Becklin. **319**, L99, 107-F9 (1987)
- IRAS Observations of Supernova Remnants: A Comparison between Their Infrared and X-Ray Cooling Rates. Eli Dwek, Robert Petre, Andrew Szymkowiak, and Walter L. Rice. **320**, 27, 114-C4 (1987)
- Global Properties of Interacting Disk-Type Galaxies. Howard A. Bushouse. **320**, 49, 108-E4 (1987)
- The IRAS Bright Galaxy Sample. II. The Sample and Luminosity Function. B. T. Soifer, D. B. Sanders, B. F. Madore, G. Neugebauer, G. E. Danielson, J. H. Elias, Carol J. Lonsdale, and W. L. Rice. **320**, 238, 110-F7 (1987)
- Star-forming Loops in the IRAS Sky Images. P. R. Schwartz. **320**, 258, 111-A1 (1987)
- Milliarcsecond Resolution Infrared Observations of Young Stars in Taurus and Ophiuchus. M. Simon, R. R. Howell, A. J. Longmore, B. A. Wilking, D. M. Peterson, and W.-P. Chen. **320**, 344, 111-G3 (1987)
- CO Observations of IRAS Sources with 11.3 Micron Silicon Carbide Dust Features. D. A. Leahy, Sun Kwok, and R. A. Arguilla. **320**, 825, 118-F13 (1987)
- A Survey of IRAS Point Sources in Taurus for High-Velocity Molecular Gas. Mark H. Heyer, Ronald L. Snell, Paul F. Goldsmith, and Philip C. Myers. **321**, 370, 126-C3 (1987)
- Far-Infrared Properties of Cluster Galaxies. Michael D. Bica and Riccardo Giovanelli. **321**, 645, 131-E11 (1987)
- Far-Infrared Continuum Emission from the Nucleus, Starburst, and Extended Spiral Arms of NGC 1068. D. F. Lester, M. Joy, P. M. Harvey, H. B. Ellis, Jr., and P. S. Parmar. **321**, 755, 132-G1 (1987)
- Ground-based Infrared Observations of Variable IRAS Sources as Candidates for Late Asymptotic Giant Branch Stars. Sun Kwok, Bruce J. Hrivnak, and R. T. Boreiko. **321**, 975, 135-B11 (1987)
- The 2 Micron Spectrum of L1551 IRS 5. John S. Carr, P. M. Harvey, and D. F. Lester. **321**, L71, 129-G7 (1987)
- The Extraordinary CO Luminosity of the Far-Infrared Galaxy VII Zw 31: A Possible Proto-Galactic Disk? Leslie J. Sage and P. M.

Infrared: Source -Continued

- S. Ionom.* **321**, L103, 137-A9 (1987)
- Optical Spectroscopy of IRAS Sources with Infrared Emission Bands: IRAS 21282 + 5050 and the Diffuse Interstellar Bands. *Martin Co. en and B. F. Jones.* **321**, L151, 137-E1 (1987)
- Cosmological Parameters from the IRAS Galaxy Sample. *Jens Verner Villumsen and Michael A. Strauss.* **322**, 37, 138-D1 (1987)
- Arcsec Observations of IRAS Galaxies at 21 and 18 Centimeters Wavelengths. *Robert W. Garwood, George Helou, and John M. Dickey.* **322**, 88, 138-G11 (1987)
- Large-Scale Galactic Dust Morphology and Physical Conditions from IRAS Observations. *T. J. Sadriski, E. Dwek, M. G. Hauser, and F. J. Kerr.* **322**, 101, 139-A10 (1987)
- The CO Contents of Dwarf Irregular Galaxies. *Linda J. Tacconi and Judith S. Young.* **322**, 681, 147-C1 (1987)
- OH Megamasers in High-Luminosity IRAS Galaxies. *I. F. Mirabel and D. B. Sanders.* **322**, 688, 147-C8 (1987)
- Properties of Evolved Mass-losing Stars in the Milky Way and Variations in the Interstellar Dust Composition. *Harley A. Thronson, Jr., William B. Latter, John H. Black, John Bally, and Perry Hacking.* **322**, 770, 148-C5 (1987)
- The Infrared Diagnostic of a Dusty Plasma with Applications to Supernova Remnants. *Eli Dwek.* **322**, 812, 148-F6 (1987)
- Near-Infrared Observations of Submillijansky Radio Sources: Evidence for a Population of Starburst Galaxies at Intermediate Redshifts. *Trinh X. Thuan and J. J. Condon.* **322**, L9, 145-A11 (1987)
- The Spatial Distribution of 10 Micron Luminosity in Spiral Galaxies. *Nicholas Devereux.* **323**, 91, 154-B1 (1987)
- Far-Infrared Variability in Active Galactic Nuclei. *R. A. Edelson and M. A. Malkan.* **323**, 516, 160-B14 (1987)
- Direct Imaging at 12 Microns of the Star-forming Region W51 IRS 2. *John Bally, John F. Arens, Roger Ball, Robert Becker, and John Lacy.* **323**, L73, 158-F1 (1987)
- A Very Deep IRAS Survey at $l = 97^\circ$, $b = 30^\circ$. *Perry Hacking and J. R. Houck.* **323**, 311, 5-A3 (1987) (Abstr. in **312**, 965, 13-E6)
- Optical Survey of IRAS Fields in the Draco Cloud Region. *H. M. Johnson and A. R. Klemola.* **323**, 701, 11-C8 (1987) (Abstr. in **313**, 931, 26-G14)
- Far-Infrared Luminosities of Markarian Starburst Galaxies. II. Individual Galaxies. *L. K. Deutsch and S. P. Willner.* **323**, 803, 13-E14 (1987) (Abstr. in **314**, 831, 38-F7)
- Yellow Evolved Stars in Open Clusters. *James R. Sowell.* **323**, 241, 19-D5 (1987) (Abstr. in **315**, 732, 48-E13)
- Optical and Near-Infrared Observations of BL Lacertae Objects and Active Quasars. *Paul S. Smith, Thomas J. Balonek, Richard Elston, and Paul A. Heckert.* **323**, 459, 22-G9 (1987) (Abstr. in **316**, 860, 61-E2)
- A Flux-limited Sample of Galactic Carbon Stars. *M. J. Claussen, S. G. Kleinmann, R. R. Joyce, and M. Jura.* **323**, 385, 33-F1 (1987) (Abstr. in **321**, 1050, 136-A1)
- Infrared: Spectra**
- Infrared Continuum Radiation from Red Giants. *William K. Rose.* **312**, 284, 4-A9 (1987)
- Infrared Spectroscopy of IRC +10420. *John D. Fix and Michael L. Cobb.* **312**, 290, 4-B1 (1987)
- Emission from CO Band Heads in Young Stellar Objects. *T. R. Geballe and S. E. Persson.* **312**, 297, 4-B8 (1987)
- IRAS Large-Beam and Ground-Based Small-Beam Measurements of the Unidentified 11.3 and [Ne II] 12.8 Micron Line Fluxes in the Starburst Galaxy M82. *P. D. LeVan and S. D. Price.* **312**, 592, 9-D1 (1987)
- Line Excess in Low-Luminosity Young Stellar Objects. *Rodger I. Thompson.* **312**, 784, 11-D13 (1987)
- Magnetic Field Measurements on the Sun and Implications for Stellar Magnetic Field Observations. *Wei-Hsin Sun, Mark S. Giampapa, and Simon P. Worden.* **312**, 930, 13-B1 (1987)
- The Origin of the Photoionizing Continuum of Active Galactic Nuclei and Quasars. *S. L. O'Dell, H. A. Scott, and W. A. Stein.* **313**, 164, 16-F14 (1987)
- Recombination Spectroscopy of Star-Formation Regions in the Nucleus of M83. *Jean L. Turner, Paul T. P. Ho, and Sara C. Beck.* **313**, 644, 23-G2 (1987)
- Infrared Spectroscopy of the Supernova Remnant IC 443. *James R. Graham, Gillian S. Wright, and Andrew J. Longmore.* **313**, 847, 26-A7 (1987)
- Detection of Interstellar CH in the Far-Infrared. *Gordon J. Stacey, J. B. Lugten, and R. Genzel.* **313**, 859, 26-B9 (1987)
- New Lines of Ethylene and a Search for Methylene in IRC +10216. *D. M. Goldhaber, A. L. Betz, and J. J. Ottusch.* **314**, 356, 32-A13 (1987)
- Amorphous Carbon and the Unidentified Infrared Bands. *A. Borghesi, E. Bussoletti, and L. Colangeli.* **314**, 422, 32-G2 (1987)
- Far-Infrared Spectroscopy of Star Formation Regions in M82. *P. B. Duffy, E. F. Erickson, M. R. Haas, and J. R. Houck.* **315**, 68, 40-F6 (1987)
- Two Micron CO Absorption Lines in the Spectrum of Epsilon Aurigae during Eclipse. *Kenneth H. Hinkle and Theodore Simon.* **315**, 296, 43-B9 (1987)
- Anharmonicity and the Interstellar Polycyclic Aromatic Hydrocarbon Infrared Emission Spectrum. *John R. Barker, L. J. Allamandola, and A. G. G. M. Tielens.* **315**, L61, 45-E14 (1987)
- Infrared Photometry and Spectroscopy of Supernova 1986g in NGC 5128-Centaurus A. *Jay A. Frogel, Brooke Gregory, Kuniaki Kawara, Dave Laney, M. M. Phillips, Don Terndrup, Frederick Vrba, and Albert E. Whitford.* **315**, L129, 49-E11 (1987)
- Near-Infrared Spectra of Seyfert Nuclei. I. The Reddening Problem. *Martin J. Ward, Thomas Geballe, Malcolm Smith, Richard Wade, and Peder Williams.* **316**, 138, 51-D13 (1987)
- Infrared Line Observations of Low-Luminosity Outflow Sources. *Howard A. Smith, J. Fischer, T. R. Geballe, and P. R. Schwartz.* **316**, 265, 52-G12 (1987)
- Evolution and Infrared Spectra of Brown Dwarfs: Erratum. *Jonathan I. Lunine, William B. Hubbard, and Mark S. Marley.* **316**, 473, 55-B13 (1987) (Orig. paper in **310**, 238, 134-F2)
- Thermal Emission from Bok Globules. *Man Hoi Lee and C. Rogers.* **317**, 197, 66-B8 (1987)
- Radial Velocities of Late-Type Stars in the Galactic Center. *K. Seligren, D. N. B. Hall, S. G. Kleinmann, and N. Z. Scoville.* **317**, 881, 75-F5 (1987)
- Detection of Vibration-Rotation Band Lines of Shocked CO in Orion. *T. R. Geballe and Ron Garden.* **317**, L107, 78-E9 (1987)
- The Infrared Emission-Line Spectrum of γ Cassiopeiae. *F. Hamann and M. Simon.* **318**, 356, 82-F10 (1987)
- Optical Properties of Interstellar Graphite and Silicate Grains: Erratum. *B. T. Draine and Hyung Mok Lee.* **318**, 485, 84-C4 (1987) (Orig. paper in **285**, 89, 111-A3)
- The Continuum of Type I Seyfert Galaxies. II. Separating Thermal and Nonthermal Components. *N. P. Carleton, Martin Elvis, G. Fabbiano, S. P. Willner, A. Lawrence, and Martin Ward.* **318**, 595, 87-D6 (1987)
- Para/Ortho Abundance Ratio of Molecular Hydrogen in NGC 2023. *K. Takayanagi, K. Sakimoto, and K. Onda.* **318**, L81, 92-E2 (1987)
- Infrared Emission and Star Formation in Early-Type Galaxies. *Harley A. Thronson, Jr. and John Bally.* **319**, L63, 107-D1 (1987)
- Observations of Infrared Emission Lines and Radio Continuum Emission from Pre-Main-Sequence Objects. *Neal J. Evans II, Russell M. Leveault, S. Beckwith, and Mike Skrutskie.* **320**, 364, 112-A9 (1987)
- The Broad-Line Region at the Center of the Galaxy. *T. R. Geballe, R. Wade, K. Krisciunas, I. Gatley, and M. C. Bird.* **320**, 562, 115-F12 (1987)
- Ionization State in and Reddening to the Center of the Galaxy. *R. Wade, T. R. Geballe, K. Krisciunas, I. Gatley, and M. C. Bird.* **320**, 570, 115-G7 (1987)
- Far-Infrared Measurements of N/O in H II Regions: Evidence for Enhanced CN Process Nucleosynthesis in the Inner Galaxy. *D. F. Lester, H. L. Dinerstein, M. W. Werner, D. M. Watson, R. Genzel, and J. W. V. Storey.* **320**, 573, 116-A1 (1987)
- Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. *V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storch-Bergmann, and J. Matthews.* **320**, 589, 116-B3 (1987)
- Molecular Hydrogen Line Emission in Seyfert Galactic Nuclei. *J. Fischer, T. R. Geballe, Howard A. Smith, M. Simon, and J. W. V. Storey.* **320**, 667, 117-B2 (1987)
- LTE Modeling of Inhomogeneous Chromospheric Structure Using High-Resolution Limb Observation. *C. Lindsey.* **320**, 893, 119-E9 (1987)
- A Solar Chromosphere and Spicule Model Based on Far-Infrared Limb Observations. *D. Braun and C. Lindsey.* **320**, 898, 119-E11 (1987)
- Infrared Spectrum of Quenched Carbonaceous Composite (QCC). II. A New Identification of the 7.7 and 8.6 Micron Unidentified Infrared Emission Bands. *Akira Sakata, Setsuko Wada, Takashi Onaka, and Alan T. Tokunaga.* **320**, L63, 114-E9 (1987)
- Broad-Band Properties of the C/A Seyfert Galaxies. II. Infrared to Millimeter Properties. *R. A. Edelson, M. A. Malkan, and G. H. Rieke.* **321**, 233, 124-G1 (1987)
- Interpretation of Rotationally Excited Far-Infrared OH Emission in Orion-KL. *G. J. Melnick, R. Genzel, and J. B. Lugten.* **321**, 530, 127-G10 (1987)
- Airborne Spectrophotometry of Eta Carinae from 4.5 to 7.5 Microns and a Model for Source Morphology. *Ray W. Russell, David K. Lynch, John A. Hackwell, Richard J. Rudy, George S. Rossano, and M.*

- W. Castelaz. **321**, 937, 134-G1 (1987)
- Two Micron Spectroscopy of IRAS Galaxies. *Kimiaki Kawara, Minoru Nishida, and Brooke Gregory*. **321**, L35, 129-D12 (1987)
- Forbidden Lines of Si I: An Alternate Interpretation for an Infrared Emission Feature in the Spectrum of SN 1983N (M83). *E. Oliva*. **321**, L45, 129-E12 (1987)
- The 2 Micron Spectrum of L1551 IRS 5. *John S. Carr, P. M. Harvey, and D. F. Lester*. **321**, L71, 129-G7 (1987)
- Ions in Grain Mantles: The 4.62 Micron Absorption by OCN⁻ in W33A. *Ruud J. A. Grim and J. Mayo Greenberg*. **321**, L91, 130-A11 (1987)
- Predicted [Ni II] Infrared Line Strengths in the Crab Nebula and IC 443. *Richard B. C. Henry*. **322**, 399, 142-B12 (1987)
- Near-Infrared H₂ Emission from Herbig-Haro Objects. I. A Survey of Low-Excitation Objects. *Richard D. Schwartz, Martin Cohen, and Peredur M. Williams*. **322**, 403, 142-C2 (1987)
- Fluorescent Excitation of Interstellar H₂. *John H. Black and Ewine F. van Dishoeck*. **322**, 412, 142-C11 (1987)
- Tabulated Optical Properties of Graphite and Silicate Grains: Erratum. *B. T. Draine*. **64**, 505, 23-C11 (1987) (Abstr. in **289**, 861, 21-F4)
- Further Observations of the He I 10830 Å Chromospheric Line in Stars. *David L. Lambert*. **65**, 255, 32-A1 (1987) (Abstr. in **320**, 936, 120-B1)
- The Near-Infrared Spectrum of the FeH Molecule. *John G. Phillips, Sumner P. Davis, Bo Lindgren, and Walter J. Balfour*. **65**, 721, 39-F2 (1987) (Abstr. in **322**, 1077, 151-G3)
- Instabilities**
- Supercloud Formation by Nonaxisymmetric Gravitational Instabilities in Sheared Magnetic Galaxy Disks. *Bruce G. Elmegreen*. **312**, 626, 9-F10 (1987)
- Current-driven Magnetohydrodynamic Thermal Instabilities in Sheared Fields. *G. Bodo, A. Ferrari, S. Massaglia, and R. Rosner*. **313**, 432, 19-F10 (1987)
- The Growth of Linear Perturbations of Adiabatic Shock Waves. *Dongsu Ryu and Ethan T. Vishniac*. **313**, 820, 25-F8 (1987)
- A Variational Principle for Determining the Oscillations and Stability of Stellar Systems. *John Everson*. **314**, 47, 28-E1 (1987)
- Linear and Nonlinear Dynamic Instability of Rotating Polytropes. *Harold A. Williams and Joel E. Tohline*. **315**, 594, 47-B10 (1987)
- On the Antonov Criterion for Gravitothermal Instability. *J. F. Luciani and R. Pellat*. **317**, 241, 66-E8 (1987)
- An Instability of Radiative Acceleration. *J. I. Katz*. **317**, 264, 66-G3 (1987)
- Incompressible Magnetohydrodynamic Surface Waves: Nonlinear Aspects. *Joseph V. Hollweg*. **317**, 918, 76-B11 (1987)
- Dynamical Instability of a Model of M87. *David Merritt*. **319**, 55, 93-E14 (1987)
- On the Thermal Instability of Galactic and Cluster Halos. *A. Malagoli, R. Rosner, and G. Bodo*. **319**, 622, 101-G8 (1987)
- A Dynamical Instability Model for the Period Gap of Cataclysmic Variable Binary Systems. *Ronald E. Taam and P. N. McDermott*. **319**, L83, 107-E8 (1987)
- Period Doubling Bifurcations and Chaos in W Virginis Models. *J. Robert Buchler and Géza Kovács*. **320**, L57, 114-E3 (1987)
- The Dynamical Oscillation and Propulsion of Magnetic Fields in the Convective Zone of a Star. III. Accumulation of Heat and the Onset of the Rayleigh-Taylor Instability. *E. N. Parker*. **321**, 1009, 135-E3 (1987)
- Evolution of the Axial Electron Cyclotron Maser Instability, with Applications to Solar Microwave Spikes. *Loukas Vlahos and Phillip Sprangle*. **322**, 463, 143-A10 (1987)
- Fragmentation of Rapidly Rotating Gas Clouds. I. A Universal Criterion for Fragmentation. *Izumi Hachisu, Joel E. Tohline, and Yoshiharu Eriguchi*. **323**, 592, 161-C1 (1987)
- A New Example of the Papaloizou-Pringle Instability. *M. A. Abramowicz, O. M. Blaes, and P. Ghosh*. **323**, 629, 161-E10 (1987)
- Instruments**
- Very High Energy Gamma-Ray Spectroscopy. *David Eichler and James H. Adams, Jr.* **317**, 551, 70-A1 (1987)
- The Perseus Flasher and Satellite Glints. *Bradley E. Schaefer, Michael Barber, John J. Brooks, Allen DeForrest, Paul D. Maley, Norman W. McLeod III, Russ McNeil, Andrew J. Noymer, A. K. Presnell, Richard Schwartz, and Scott Whitney*. **320**, 398, 112-D2 (1987)
- Cosmic-Ray Elemental Abundances from 1 to 10 GeV per AMU for Boron through Nickel. *Robert Dwyer and Peter Meyer*. **322**, 981, 150-E12 (1987)
- Interferometry**
- The Dust Shells of NML Cygnus and IRC 10420: Inner Radius, Temperature, and Optical Thickness: Erratum. *Stephen T. Ridgway, Richard R. Joyce, Dennis Connors, Judith L. Pipher, and Christopher Dainty*. **312**, 963, 13-E1 (1987) (Orig. paper in **302**, 662, 37-G8)
- On the Binary Nature of Van Biesbroeck 8. *C. Perrier and J.-M. Mariotti*. **312**, L27, 7-B12 (1987)
- The H α Chromosphere of Alpha Orionis. *Jeremy C. Hehden, Andreas Eckart, and E. Keith Hege*. **314**, 690, 37-B10 (1987)
- Multiepoch VLBI Observations of 4C 39.25: Superluminal Motion and Stationary Structure. *David B. Shaffer, Alan P. Marscher, Jon Marcaide, and Jonathan D. Romney*. **314**, L1, 33-B4 (1987)
- Finsen 342 and the Hyades Distance Modulus. *Deane M. Peterson and Richard Solensky*. **315**, 286, 43-A13 (1987)
- Infrared Speckle Interferometry and Imaging of Several OH/IR Stars. *Michael L. Cobb and John D. Fix*. **315**, 325, 43-D10 (1987)
- Astrophysical Implications of the Multifrequency VLA Observations of NGC 1265. *Christopher P. O'Dea and Frazer N. Owen*. **316**, 95, 51-A11 (1987)
- The Radio Morphology of 3C 120 on Scales from 0.5 Parsecs to 400 Kiloparsecs. *R. C. Walker, J. M. Benson, and S. C. Unwin*. **316**, 546, 58-A5 (1987)
- On the Apparent Velocity of Integrated Sunlight. I. 1983-1985. *Drake Deming, Fred Espenak, Donald E. Jennings, James W. Brault, and Jeremy Wagner*. **316**, 771, 60-E4 (1987)
- 92 Centimeter VLBI Structure of the Elliptical Galaxy MCG 5-4-18: Erratum. *J. M. Wrobel and R. S. Simon*. **316**, 858, 61-D14 (1987) (Orig. paper in **309**, 593, 127-F6)
- VLBI Observations of the 3C 111 Jet. *Roger Linfield*. **317**, 121, 65-C7 (1987)
- The Distribution of Maser Emission in OH/IR Stars. *Alan D. Welty, John D. Fix, and Robert L. Mutel*. **318**, 852, 90-C10 (1987)
- 18 Centimeter VLBI Observations of the Quasar NRAO 140 during and after a Low-Frequency Outburst. *Alan P. Marscher, John J. Broderick, Lucia Padrielli, Norbert Bartel, and Jonathan D. Romney*. **319**, 456, 98-B8 (1987)
- VLA Observations of a Solar Noise Storm. *Kenneth R. Lang and Robert F. Willson*. **319**, 514, 98-G8 (1987)
- Multifrequency VLBI Observations of 4C 39.25: A Superluminal Source without a Well-defined Core. *Alan P. Marscher, David B. Shaffer, Roy S. Booth, and Barry J. Geldzahler*. **319**, L69, 107-D7 (1987)
- Direct Infrared Observations of the Very Low Mass Object Gliese 623B. *D. W. McCarthy, Jr. and T. J. Henry*. **319**, L93, 107-F3 (1987)
- Structure of a Possible Circumbinary Disk around T Tauri. *D. A. Weintraub, C. R. Masson, and B. Zuckerman*. **320**, 336, 111-F9 (1987)
- Detection of a Very Bright Source Close to the LMC Supernova SN 1987A. *P. Nisenson, C. Papaliolios, M. Karovska, and R. Noyes*. **320**, L15, 114-B4 (1987)
- Interstellar Interferometry of the Pulsar PSR 1237 + 25. *A. Wolszczan and J. M. Cordes*. **320**, L35, 114-C11 (1987)
- Solar System-Sized Condensations in the Orion Nebula. *E. Churchwell, M. Felli, D. O. S. Wood, and M. Massi*. **321**, 516, 127-F11 (1987)
- The Inner Beams of SS 433. *Jonathan D. Romney, Richard T. Schilizzi, István Fejes, and Ralph E. Spencer*. **321**, 822, 133-E3 (1987)
- Superluminal Motion in the Double-lobed Quasar 3C 245. *D. H. Hough and A. C. S. Readhead*. **321**, L11, 129-C1 (1987)
- Giant Molecular Clouds in M31. *S. N. Vogel, F. Boulanger, and R. Ball*. **321**, L145, 137-D8 (1987)
- VLBI Structure of 3C 84 at 89 GHz. *D. C. Backer, M. C. H. Wright, R. L. Plambeck, J. E. Carlstrom, C. R. Masson, A. T. Moffet, A. C. S. Readhead, D. Woody, A. E. E. Rogers, J. M. Moran, C. R. Predmore, and R. L. Dickman*. **322**, 74, 138-F11 (1987)
- Linear Polarization Structure of the BL Lacertae Object OJ 287 at Milliarcsecond Resolution. *D. H. Roberts, D. C. Gabuzda, and J. F. C. Wardle*. **323**, 536, 160-E5 (1987)
- H₂O Masers in Circumstellar Envelopes. *Adair P. Lane, K. J. Johnston, P. F. Bowers, J. H. Spencer, and P. J. Diamond*. **323**, 756, 163-A8 (1987)
- Intergalactic Medium**
- Hydrogen Molecules and the Radiative Cooling of Pregalactic Shocks. *Paul R. Shapiro and Hyesung Kang*. **318**, 32, 79-C8 (1987)
- Star Formation in X-Ray Cluster Cooling Flows. *Raymond E. White III and Craig L. Sarazin*. **318**, 612, 87-E9 (1987)
- Determining Star Formation Rates in X-Ray Cluster Cooling Flows. *Raymond E. White III and Craig L. Sarazin*. **318**, 621, 87-F5 (1987)
- Numerical Models of Star Formation in X-Ray Cluster Cooling Flows. *Raymond E. White III and Craig L. Sarazin*. **318**, 629, 87-F14 (1987)
- Interplanetary Medium**
- Jovian Electrons at 1 AU: 1978-1984. *Dan Moses*. **313**, 471, 20-B8 (1987)
- Magnetic Helicity of the Parker Field. *J. W. Bieber, P. A. Evenson, and W. H. Matthaeus*. **315**, 700, 48-C7 (1987)
- Interplanetary Radial Cosmic-Ray Gradients and Their Implication for a Possible Large Modulation Effect at the Heliospheric Boundary. *W. R. Webber and J. A. Lockwood*. **317**, 534, 69-F11 (1987)
- Solar Cycle Study of Interplanetary Lyman-Alpha Variations:

Interplanetary Medium—Continued

- PIONEER VENUS Orbiter Sky Background Results. *J. M. Ajello, A. I. Stewart, G. E. Thomas, and A. Graps.* **317**, 964, 76-F5 (1987)
- Diffusive Shock Acceleration: Comparison of a Unified Shock Model to Bow Shock Observations. *Donald C. Ellison and Eberhard Möbius.* **318**, 474, 84-B6 (1987)
- Inversion of the Zodiacal Infrared Brightness Integral. *S. S. Hong and I. K. Um.* **320**, 928, 120-A5 (1987)
- A Multispacecraft Study of the Injection and Transport of Solar Energetic Particles. *J. Beeck, G. M. Mason, D. C. Hamilton, G. Wibberenz, F. Kunow, D. Hovestadt, and B. Klecker.* **322**, 1052, 151-D14 (1987)
- Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of *Voyager 2*. *John D. Anderson, Timothy P. Krisher, Susan E. Borutski, Michael J. Connolly, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen.* **323**, L141, 164-E1 (1987)

Interstellar: Abundances

- Ion-Molecule Calculation of the Abundance Ratio of CCD to CCH in Dense Interstellar Clouds. *Eric Herbst, Nigel G. Adams, David Smith, and D. J. DeFrees.* **312**, 351, 4-F7 (1987)
- Upper Limits to Interstellar PO. *H. E. Matthews, P. A. Feldman, and P. F. Bernath.* **312**, 358, 4-F14 (1987)
- Three Families of Diffuse Interstellar Bands? *J. Krelowski and G. A. H. Walker.* **312**, 860, 12-C11 (1987)
- Detection of Interstellar CH in the Far-Infrared. *Gordon J. Stacey, J. B. Lugten, and R. Genzel.* **313**, 859, 26-B9 (1987)
- A New Assault on the 92 Centimeter Line of D I. *Leo Blitz and Carl Heiles.* **313**, L95, 27-E9 (1987)
- A Search for Interstellar Neutral Sodium at 17 Centimeter Wavelength. *B. E. Turner.* **314**, 363, 32-B6 (1987)
- Observations of SiO toward OMC-1: A New Outflow Source I/T5 South of Orion-KL? *L. M. Ziurys and P. Friberg.* **314**, L49, 39-B12 (1987)
- Molecular Abundances in OMC-1: The Chemical Composition of Interstellar Molecular Clouds and the Influence of Massive Star Formation. *Geoffrey A. Blake, E. C. Sutton, C. R. Masson, and T. G. Phillips.* **315**, 621, 47-D9 (1987)
- IUE Observations of Hydrogen and Deuterium in the Local Interstellar Medium. *J. Murthy, R. C. Henry, H. W. Moos, W. B. Landsman, J. L. Linsky, A. Vidal-Madjar, and C. Gry.* **315**, 675, 48-A10 (1987)
- The CO $J = 2 \rightarrow 1$ Emission from the Interstellar Gas toward Zeta Ophiuchi. *R. M. Crutcher and S. R. Federman.* **316**, L71, 62-C2 (1987)
- Molecules at Early Epochs. II. H_2 and CO toward PHL 957. *John H. Black, Frederic H. Chaffee, Jr., and Craig B. Foltz.* **317**, 442, 68-G2 (1987)
- A New Constraint on the Galactic Plane ^{26}Al Distribution. *C. J. MacCallum, A. F. Hutters, P. D. Stang, and M. Leventhal.* **317**, 877, 75-F1 (1987)
- The $^{12}C/^{13}C$ Isotope Ratio of the Interstellar Medium in the Neighborhood of the Sun. *Isabel Hawkins and Michael Jura.* **317**, 926, 76-C5 (1987)
- On the Synthesis of $c-C_3H_2$ in Interstellar Clouds. *Nigel G. Adams and David Smith.* **317**, L25, 71-B13 (1987)
- Models of Molecular Cloud Cores. III. A Multitransition Study of H_2CO . *Lee G. Mundy, Neal J. Evans II, Ronald L. Snell, and Paul F. Goldsmith.* **318**, 392, 83-B11 (1987)
- The Abundance of H_3^+ Ions in Dense Interstellar Clouds. *S. Lepp, A. Dalgarno, and A. Sternberg.* **321**, 383, 126-D4 (1987)
- High-Resolution Ultraviolet Observations of Interstellar Lines toward ξ Persei Observed with the Balloon-borne Ultraviolet Spectrometer. *Theodore P. Snow, H. J. G. L. M. Lamers, and Charles L. Joseph.* **321**, 952, 135-A2 (1987)
- Detection of Interstellar PN: The First Identified Phosphorus Compound in the Interstellar Medium. *B. E. Turner and John Bally.* **321**, L75, 129-G11 (1987)
- Detection of Interstellar PN: The First Phosphorus-bearing Species Observed in Molecular Clouds. *L. M. Ziurys.* **321**, L81, 130-A2 (1987)
- Single Gaussian Curve of Growth Abundance Determinations from Ultraviolet Interstellar Absorption-Line Data. *A. W. Harris.* **322**, 368, 141-G9 (1987)
- The Interstellar Clouds toward 3C 154 and 3C 353. *S. R. Federman, Neal J. Evans II, R. F. Willson, E. Falgarone, F. Combes, and B. M. Scheufele.* **322**, 960, 150-D4 (1987)
- The C/CO Ratio in Dense Interstellar Clouds. *R. Gredel, S. Lepp, and A. Dalgarno.* **323**, L137, 164-D12 (1987)

High-Resolution Spectra of 24 Low-Redshift QSOs: The Properties of Mg II Absorption Systems. *David Tytler, A. Boksenberg, Wallace L. W. Sargent, Peter Young, and Daniel Kunth.* **64**, 667, 27-B8 (1987) (Abstr. in **318**, 945, 91-C10)

Systematic Properties of CO Emission from Galaxies. I. Luminosity Function. *Frances Verter.* **65**, 555, 37-A1 (1987) (Abstr. in **322**, 1075, 151-G1)

Interstellar: Grains

- Dust Reradiation from M43. *J. Smith, D. A. Harper, and R. F. Loewenstein.* **314**, 76, 28-G7 (1987)
- The Effects of Dust on the Propagation and Dissipation of Alfvén Waves in Interstellar Clouds. *W. Pilipp, T. W. Hartquist, O. Havnes, and G. E. Morfill.* **314**, 341, 37-G9 (1987)
- Amorphous Carbon and the Unidentified Infrared Bands. *A. Borghesi, E. Bussoletti, and L. Colangeli.* **314**, 422, 32-G2 (1987)
- A Physical Model for the 2175 Å Interstellar Extinction Feature: Erratum. *J. H. Hecht.* **314**, 429, 32-G9 (1987) (Orig. paper in **305**, 817, 77-G6)
- A 217.5 Nanometer Absorption Feature in the Spectrum of Small Silicate Particles. *T. M. Steel and W. W. Duley.* **315**, 337, 43-E8 (1987)
- On the Contribution of Interstellar Extinction to the 10 Micron Dust Feature in OH/IR Stars. *Kevin Volk and Sun Kwok.* **315**, 654, 47-G1 (1987)
- The Continuum Spectra of Dust Complexes Associated with W3 Main, M42, W49A, and W51A. *M. A. Gordon.* **316**, 258, 52-G5 (1987)
- Thermal Emission from Bok Globules. *Man Hoi Lee and C. Rogers.* **317**, 197, 66-B8 (1987)
- Temperature and Emission-Measure Distributions for Several Planetary Nebulae. *J. P. Basart and C. T. Daub.* **317**, 412, 68-D14 (1987)
- Optical Properties of Interstellar Graphite and Silicate Grains: Erratum. *B. T. Draine and Hyung Mok Lee.* **318**, 485, 84-C4 (1987) (Orig. paper in **285**, 89, 111-A3)
- Observations of 1.3 Millimeter Emission from the Centers of Galaxies. *Harley A. Thronson, Jr., Christopher K. Walker, Constance E. Walker, and Philip Maloney.* **318**, 645, 88-A4 (1987)
- The Structure of Time-dependent Interstellar Shocks and Grain Destruction in the Interstellar Medium. *Christopher F. McKee, David J. Hollenbach, C. Gregory Seab, and A. G. G. M. Tielens.* **318**, 674, 88-C7 (1987)
- IRAS Observations of Collisionally Heated Dust in Large Magellanic Cloud Supernova Remnants. *James R. Graham, A. Evans, J. S. Albinson, M. F. Bode, and W. P. S. Meikle.* **319**, 126, 94-D5 (1987)
- Shock Processing of Interstellar Dust: Diamonds in the Sky. *A. G. G. M. Tielens, C. G. Seab, D. J. Hollenbach, and Christopher F. McKee.* **319**, L109, 107-G6 (1987)
- Hot Dust and the Near-Infrared Bump in the Continuum Spectra of Quasars and Active Galactic Nuclei. *Richard Barvainis.* **320**, 537, 115-D4 (1987)
- Collisional Charging of Interstellar Grains. *B. T. Draine and Brian Sutin.* **320**, 803, 118-E5 (1987)
- Long-Wavelength Absorption by Fractal Dust Grains. *Edward L. Wright.* **320**, 818, 118-F9 (1987)
- CO Observations of IRAS Sources with 11.3 Micron Silicon Carbide Dust Features. *D. A. Leahy, Sun Kwok, and R. A. Arquilla.* **320**, 825, 118-F13 (1987)
- The Unusual Dust-scattering Properties in the Reflection Nebula CED 201. *A. N. Witt, R. C. Bohlin, T. P. Stecher, and S. M. Graff.* **321**, 912, 134-E4 (1987)
- Extinction and Abundance Properties of Alpha Scorpii Circumstellar Grains. *Theodore P. Snow, Jr., Richard H. Buss, Jr., D. P. Gilra, and J. P. Swings.* **321**, 921, 134-E13 (1987)
- Interstellar Amorphous Carbon. *E. Bussoletti, L. Colangeli, and V. Orfino.* **321**, L87, 130-A7 (1987)
- Ions in Grain Mantles: The 4.62 Micron Absorption by OCN^- in W33A. *Ruud J. A. Grim and J. Mayo Greenberg.* **321**, L91, 130-A11 (1987)
- Large-Scale Galactic Dust Morphology and Physical Conditions from IRAS Observations. *T. J. Sedroski, E. Dwek, M. G. Hauser, and F. J. Kerr.* **322**, 101, 139-A10 (1987)
- The Effect of a Quasi-stellar Object on Its Host Galaxy: Dynamical and Physical Processes in the Interstellar Medium around a Quasi-stellar Object. *C. A. Chang, A. V. R. Schiano, and A. M. Wolfe.* **322**, 180, 139-G8 (1987)
- Carbon Grains in the Envelope of IRC +10216. *P. G. Martin and C. Rogers.* **322**, 374, 142-A1 (1987)
- The Infrared Diagnostic of a Dusty Plasma with Applications to Supernova Remnants. *Eli Dwek.* **322**, 812, 148-F6 (1987)
- Maps of Dust Clouds at 1.3 Millimeters Associated with Bright H II Regions. *M. A. Gordon and P. R. Jewell.* **323**, 766, 163-B5 (1987)
- Tabulated Optical Properties of Graphite and Silicate Grains: Erratum.

- B. T. Draine. **64**, 505, 23-C11 (1987) (Abstr. in **289**, 861, 21-F4)
- Interstellar: Magnetic Fields**
- Ultra-High Energy Cosmic Rays in a Galactic Wind and Its Termination Shock. J. R. Jokipii and G. Morfill. **312**, 170, 2-G5 (1987)
- The Circumstellar Envelope of W3(OH): NH_3 Observations. Mark J. Reid, Philip C. Myers, and John H. Bieging. **312**, 830, 12-A9 (1987)
- Magnetic Fields in Extragalactic Jets. William K. Rose. **313**, 146, 16-E10 (1987)
- A Simulation of High-Energy Cosmic-Ray Propagation. M. Honda. **319**, 836, 104-B7 (1987)
- Structural Details of the Sagittarius A Complex: Evidence for a Large-Scale Poloidal Magnetic Field in the Galactic Center Region. F. Yusef-Zadeh and M. Morris. **320**, 545, 115-D12 (1987)
- Magnetic Braking in Weakly Ionized Media. Arie H. Königl. **320**, 726, 117-F6 (1987)
- Magnetic Monopole Plasma Oscillations and the Survival of Galactic Magnetic Fields. E. N. Parker. **321**, 349, 126-A11 (1987)
- The Magnetic Evolution of the Taurus Molecular Clouds. I. Large-scale Properties. Mark H. Heyer, Frederick J. Vrba, Ronald L. Snell, F. P. Schloerb, Stephen E. Strom, Paul F. Goldsmith, and Karen M. Strom. **321**, 855, 133-G9 (1987)
- On Stable Hydrostatic Equilibrium Configurations of the Galaxy and Implications for Its Halo. J. B. G. M. Bloemen. **322**, 694, 147-D1 (1987)
- Velocity Waves in 21 Centimeter Self-Absorption toward the Taurus Molecular Complex. W. L. H. Shuter, R. L. Dickman, and C. Klatt. **322**, L103, 152-D8 (1987)
- Interstellar: Matter**
- Shells and Dark Matter in Elliptical Galaxies. Lars Hernquist and P. J. Quinn. **312**, 1, 1-A7 (1987)
- Shell Galaxies and Alternatives to the Dark Matter Hypothesis. Lars Hernquist and P. J. Quinn. **312**, 17, 1-B9 (1987)
- Pulsar Activation by the Interstellar Medium? F. Curtis Michel. **312**, 271, 3-G8 (1987)
- Improved Dispersion Measures for 17 Pulsars. T. H. Hankins. **312**, 276, 3-B13 (1987)
- Supercloud Formation by Nonaxisymmetric Gravitational Instabilities in Sheared Magnetic Galaxy Disks. Bruce G. Elmegreen. **312**, 626, 9-F10 (1987)
- Three Families of Diffuse Interstellar Bands? J. Krelowski and G. A. H. Walker. **312**, 860, 12-C11 (1987)
- NGC 5266: An Elliptical Galaxy with a Dust Ring. S. R. Varnas, F. Bertola, G. Galletta, K. C. Freeman, and D. Carter. **313**, 69, 15-F12 (1987)
- Evidence for Refractive Scintillation of Two Extragalactic Sources Seen through the Galactic Disk. Brian Dennison, R. Fiedler, K. J. Johnston, J. H. Spencer, E. B. Waltman, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis. **313**, 141, 16-E5 (1987)
- Characteristics of Old Neutron Stars in Dense Interstellar Clouds. H. Böhringer, G. E. Morfill, and H. U. Zimmermann. **313**, 218, 17-D1 (1987)
- Comparison of Submillimeter and Ultraviolet Observations of Neutral Carbon toward Zeta Ophiuchi. Jocelyn Keene, Geoffrey A. Blake, and T. G. Phillips. **313**, 396, 19-D1 (1987)
- 1300 Micron Continuum Observations of the Sagittarius B2 Molecular Cloud Core. Paul F. Goldsmith, Ronald L. Snell, and Dariusz C. Lis. **313**, L5, 21-A8 (1987)
- A Search for Interstellar Neutral Sodium at 17 Centimeter Wavelength. B. E. Turner. **314**, 363, 32-B6 (1987)
- Highly Ionized Interstellar Gas Located in the Galactic Disk and Halo. Blair D. Savage and Derck Massa. **314**, 380, 32-C11 (1987)
- A Physical Model for the 2175 Å Interstellar Extinction Feature: Erratum. J. H. Hecht. **314**, 429, 32-G9 (1987) (Orig. paper in **305**, 817, 77-G6)
- The Light of the Supernova Outburst. IV. Lowered Energy for the Echo Model. Willie R. Mackey. **315**, 251, 42-F6 (1987)
- Angular Momentum in a Turbulent Interstellar Medium. Robert C. Fleck, Jr. **315**, 259, 42-F14 (1987)
- A 217.5 Nanometer Absorption Feature in the Spectrum of Small Silicate Particles. T. M. Steel and W. W. Duley. **315**, 337, 43-E8 (1987)
- Supernovae versus Models of the Interstellar Medium and the Gaseous Halo. Carl Heiles. **315**, 555, 46-F10 (1987)
- Refractive Scintillation in the Interstellar Medium. W. A. Coles, R. G. Frechlich, B. J. Rickett, and J. L. Codona. **315**, 666, 48-A1 (1987)
- The Reddening of Cygnus A from a Measurement of Paschen-Alpha. S. J. Lilly and G. J. Hill. **315**, L103, 49-C12 (1987)
- Interdependence of the 4430 Å Diffuse Interstellar Band, Polarization, and Ultraviolet Extinction. J. Krelowski, G. A. H. Walker, G. R. Grieve, and G. M. Hill. **316**, 449, 55-A3 (1987)
- Gasdynamical Stripping of Elliptical Galaxies. T. J. Gaetz, E. E. Salpeter, and G. Shaviv. **316**, 530, 57-G3 (1987)
- Metal-enhanced Galactic Winds. II. Radiative Cooling and Pressure Effects. J. Patricia Vader. **317**, 128, 65-C14 (1987)
- Supershells and Propagating Star Formation. Richard McCray and Minas Kafatos. **317**, 190, 66-B1 (1987)
- Molecules at Early Epochs. II. H_2 and CO toward PHL 957. John H. Black, Frederic H. Chaffee, Jr., and Craig B. Foltz. **317**, 442, 68-G2 (1987)
- Dust Distribution in Spiral Galaxies. Nikolaos D. Kylafis and John N. Bahcall. **317**, 637, 73-A13 (1987)
- The H I Distribution in Clouds within Galaxies. E. J. Shaya and S. R. Federman. **319**, 76, 93-G9 (1987)
- CCD Observations of Diffuse Interstellar Bands in Reflection Nebulae. Karl Josafatsson and Theodore P. Snow. **319**, 436, 98-A1 (1987)
- CCD Observations of Diffuse Interstellar Bands in Reflection Nebulae. Karl Josafatsson and Theodore P. Snow. **319**, 436, 98-A1 (1987)
- Evolution of Hot Galactic Flows. Michael Loewenstein and William G. Mathews. **319**, 614, 101-F4 (1987)
- The Pleiades Cluster. IV. The Visit of a Molecular CO Cloud. Michel Breger. **319**, 754, 103-C9 (1987)
- Shock Processing of Interstellar Dust: Diamonds in the Sky. A. G. G. M. Tielens, C. G. Seab, D. J. Hollenbach, and Christopher F. McKee. **319**, L109, 107-G6 (1987)
- Steady State Cooling Flow Models for Normal Elliptical Galaxies. Craig L. Sarazin and Raymond E. White III. **320**, 32, 108-C11 (1987)
- H I Superclouds in the Inner Galaxy. Bruce G. Elmegreen and Debra Meloy Elmegreen. **320**, 182, 110-B1 (1987)
- Ionization State in and Reddening to the Center of the Galaxy. R. Wade, T. R. Geballe, K. Krisciunas, I. Gatley, and M. C. Bird. **320**, 570, 115-G7 (1987)
- The Interstellar Medium toward Supernova 1987A. A. K. Dupree, R. P. Kirshner, G. E. Nassiopoulou, J. C. Raymond, and G. Sonneborn. **320**, 597, 116-B11 (1987)
- Magnetic Braking in Weakly Ionized Media. Arie H. Königl. **320**, 726, 117-F6 (1987)
- The Local Interstellar Medium. VII. The Local Interstellar Wind and Interstellar Material in Front of the Nearby Star α Ophiuchi. P. C. Frisch, D. G. York, and J. R. Fowler. **320**, 842, 119-A10 (1987)
- Interstellar Interferometry of the Pulsar PSR 1237 + 25. A. Wolszczan and J. M. Cordes. **320**, L35, 114-C11 (1987)
- Infrared Spectrum of Quenched Carbonaceous Composite (QCC). II. A New Identification of the 7.7 and 8.6 Micron Unidentified Infrared Emission Bands. Akira Sakata, Setsuko Wada, Takashi Onaka, and Alan T. Tokunaga. **320**, L63, 114-E9 (1987)
- High-Resolution Ultraviolet Observations of Interstellar Lines toward ξ Persei Observed with the Balloon-borne Ultraviolet Spectrometer. Theodore P. Snow, H. J. G. L. M. Lamers, and Charles L. Joseph. **321**, 952, 135-A2 (1987)
- Large-Scale Galactic Dust Morphology and Physical Conditions from IRAS Observations. T. J. Sodoroski, E. Dwek, M. G. Hauser, and F. J. Kerr. **321**, 101, 139-A10 (1987)
- The Effect of a Quasi-stellar Object on Its Host Galaxy: Dynamical and Physical Processes in the Interstellar Medium around a Quasi-stellar Object. C. A. Chang, A. V. R. Schiano, and A. M. Wolfe. **322**, 180, 139-G8 (1987)
- On Stable Hydrostatic Equilibrium Configurations of the Galaxy and Implications for Its Halo. J. B. G. M. Bloemen. **322**, 694, 147-D1 (1987)
- Ultraviolet Interstellar Extinction toward NGC 6530 and the Intrinsic Energy Distribution of 9 Sagittarii and HD 165052. Ana V. Torres. **322**, 949, 150-C7 (1987)
- Submillimeter and Far-Infrared Spectroscopy of M17 and S106: UV-Heated, Quiescent Molecular Gas? A. I. Harris, J. Stutzki, R. Genzel, J. B. Lugten, G. J. Stacey, and D. T. Jaffe. **322**, L49, 145-D6 (1987)
- Velocity Waves in 21 Centimeter Self-Absorption toward the Taurus Molecular Complex. W. L. H. Shuter, R. L. Dickman, and C. Klatt. **322**, L103, 152-D8 (1987)
- A View of the Galactic H α Background: $208^\circ \leq l \leq 218^\circ$; $-2^\circ \leq b \leq +8^\circ$. R. J. Reynolds. **323**, 118, 154-D2 (1987)
- H α Scans of High-Velocity Clouds. R. J. Reynolds. **323**, 553, 160-F11 (1987)
- H I Survey of Face-on Galaxies: The Frequency of Distortions in H I Disks. B. M. Lewis. **63**, 515, 9-A5 (1987) (Abstr. in **313**, 928, 26-G11)
- Continuum Models for Gas in Disturbed Galaxies. III. Bifurcations and Chaos in a Deterministic Model for Bursts of Star Formation. Curtis Struck-Marcell and John M. Scalzo. **64**, 39, 17-D11 (1987) (Abstr. in **315**, 730, 48-E11)
- A Flux-limited Sample of Galactic Carbon Stars. M. J. Claussen, S. G.

Interstellar Matter—Continued

- Kleinmann, R. R. Joyce, and M. Jura. **65**, 385, 33-F1 (1987) (Abstr. in **321**, 1050, 136-A1)
- Interstellar: Molecules**
- Magnetohydrodynamic Shocks in Molecular Clouds. David F. Chernoff. **312**, 143, 2-E6 (1987)
- Molecular Clouds in the Outer Galaxy. I. Far-Infrared Observations. Kathryn N. Mead, Marc L. Kutner, Neal J. Evans II, Paul M. Harvey, and Bruce A. Wilking. **312**, 321, 4-D4 (1987)
- The Bright-Rimmed Molecular Cloud around S140 IRS. II. Bipolar Outflow from S140 IRS 1. M. Hayashi, T. Hasegawa, T. Omodaka, S. S. Hayashi, and R. Miyawaki. **312**, 327, 4-D10 (1987)
- Submillimeter Spectral Line Observations in Very Dense Regions. Neal J. Evans II, Lee G. Mundy, John H. Davis, and Paul Vanden Bout. **312**, 344, 4-E13 (1987)
- Ion-Molecule Calculation of the Abundance Ratio of CCD to CCH in Dense Interstellar Clouds. Eric Herbst, Nigel G. Adams, David Smith, and D. J. DeFrees. **312**, 351, 4-F7 (1987)
- Upper Limits to Interstellar PO. H. E. Matthews, P. A. Feldman, and P. F. Bernath. **312**, 358, 4-F14 (1987)
- Molecular Gas in the Starburst Nucleus of M82. K. Y. Lo, K. W. Cheung, C. R. Masson, T. G. Phillips, S. L. Scott, and D. P. Woody. **312**, 574, 9-B7 (1987)
- The Circumstellar Envelope of W3(OH): NH₃ Observations. Mark J. Reid, Philip C. Myers, and John H. Bieging. **312**, 830, 12-A9 (1987)
- Small-Scale Structure of the Taurus Molecular Clouds: Turbulence in Heiles' Cloud 2. S. C. Kleiner and R. L. Dickman. **312**, 837, 12-B2 (1987)
- Observations of Globules and Dark Clouds in the CO $J = 3-2$ and $J = 2-1$ Lines. L. W. Avery, Glenn J. White, I. P. Williams, and N. Cronin. **312**, 848, 12-B13 (1987)
- Detection of CO(1 \rightarrow 0) Emission and Optical Imaging of the Seyfert Galaxy/QSO Markarian 231. D. B. Sanders, J. S. Young, N. Z. Scoville, B. T. Soifer, and G. E. Danielson. **312**, L5, 7-A8 (1987)
- Compact Molecular Gas Structure in the Interacting Galaxy Pair Arp 299 (IC 694—NGC 3690). A. I. Sargent, D. B. Sanders, N. Z. Scoville, and B. T. Soifer. **312**, L35, 14-B1 (1987)
- The Molecular Cloud Ring in NGC 1068. Steven T. Myers and N. Z. Scoville. **312**, L39, 14-B6 (1987)
- Filamentary Structure in the Orion Molecular Cloud. John Bally, William D. Langer, Antony A. Stars, and Robert W. Wilson. **312**, L45, 14-B12 (1987)
- The Structure and Dynamics of Bok Globule B335. Margaret A. Frerking, William D. Langer, and Robert W. Wilson. **313**, 320, 18-D10 (1987)
- Comparison of Submillimeter and Ultraviolet Observations of Neutral Carbon toward Zeta Ophiuchi. Jocelyn Keene, Geoffrey A. Blake, and T. G. Phillips. **313**, 396, 19-D1 (1987)
- Detection of Interstellar CH in the Far-Infrared. Gordon J. Stacey, J. B. Lugten, and R. Genzel. **313**, 859, 26-B9 (1987)
- Can Gas Phase Reactions Produce Complex Oxygen-containing Molecules in Dense Interstellar Clouds? A Revision of Some Important Radiative Association Rate Coefficients. Eric Herbst. **313**, 867, 26-C4 (1987)
- 1300 Micron Continuum Observations of the Sagittarius B2 Molecular Cloud Core. Paul F. Goldsmith, Ronald L. Snell, and Dariusz C. Lis. **313**, L5, 21-A8 (1987)
- The Role of Orbital Dynamics and Cloud-Cloud Collisions in the Formation of Giant Molecular Clouds in Global Spiral Structures. William W. Roberts, Jr. and Glen R. Stewart. **314**, 10, 28-B4 (1987)
- Observation of the HH 1 and 2 Region with IRAS. Steven H. Pravdo and Thomas J. Chester. **314**, 308, 31-D13 (1987)
- High-Resolution Observations of CO from the Bipolar Nebula CRL 2688. R. Kawabe, M. Ishiguro, T. Kasuga, K.-I. Morita, N. Ukita, H. Kobayashi, S. Okumura, E. Fomalont, and N. Kaifu. **314**, 322, 31-F1 (1987)
- The Effects of Dust on the Propagation and Dissipation of Alfvén Waves in Interstellar Clouds. W. Pilipp, T. W. Hartquist, O. Havnes, and G. E. Morfill. **314**, 341, 37-G9 (1987)
- Long Carbon Chain Molecules in Circumstellar Shells. H. W. Kroto, J. R. Heath, S. C. O'Brien, R. F. Curl, and R. E. Smalley. **314**, 352, 32-A9 (1987)
- A Large Molecular Cloud in Lupus Far From the Galactic Plane. L.-Å. Nyman, P. Thaddeus, L. Bronfman, and R. S. Cohen. **314**, 374, 32-C4 (1987)
- Where Massive Stars Form: Associated Radio H II Regions and CO Clouds in the Northern Milky Way. W. H. Waller, D. P. Clemens, D. B. Sanders, and N. Z. Scoville. **314**, 397, 32-E4 (1987)
- Small-Scale Structure and Chemical Differential in the Central Regions of the Sagittarius B2 Molecular Cloud. Paul F. Goldsmith, Ronald L. Snell, T. Hasegawa, and N. Ukita. **314**, 525, 35-C6 (1987)
- Laboratory and Astronomical Spectroscopy of C₂H₂, the First Interstellar Organic Ring. J. M. Vrilek, C. A. Gottlieb, and P. Thaddeus. **314**, 716, 37-D8 (1987)
- Molecular Gas Within 2° of the Galactic Center. I. Survey of ¹³CO Emission. Gary M. Heiligman. **314**, 747, 37-G1 (1987)
- The Laboratory Observation of the $J = 1-0$, $K = 0$ Transition of the H₂S⁺ Ion. Shuji Saito, Satoshi Yamamoto, and Takayoshi Amano. **314**, L27, 33-C14 (1987)
- Observations of SiO toward OMC-1: A New Outflow Source 1.75 South of Orion-KL? L. M. Ziurys and P. Friberg. **314**, L49, 39-B12 (1987)
- The Spatial and Mass Distributions of Molecular Clouds and Spiral Structures. John Kwan and Francisco Valdes. **315**, 92, 41-A2 (1987)
- Molecular Clouds and the Gould Belt. David K. Taylor, R. L. Dickman, and N. Z. Scoville. **315**, 104, 41-B2 (1987)
- Molecular Clouds in the Carina Arm: Large-Scale Properties of Molecular Gas and Comparison with H I. D. A. Grabelsky, R. S. Cohen, L. Bronfman, P. Thaddeus, and J. May. **315**, 122, 41-D2 (1987)
- Detection of H I Emission from the Circumstellar Envelope of Alpha Orionis. P. F. Bowers and G. R. Knapp. **315**, 305, 43-C4 (1987)
- Low-Luminosity Embedded Sources and Their Environs. J. A. Davidson. **315**, 602, 47-C4 (1987)
- Molecular Abundances in OMC-1: The Chemical Composition of Interstellar Molecular Clouds and the Influence of Massive Star Formation. Geoffrey A. Blake, E. C. Sutton, C. R. Masson, and T. G. Phillips. **315**, 621, 47-D9 (1987)
- Observations of OCS and a Search for OC₂S in the Interstellar Medium. H. E. Matthews, J. M. MacLeod, N. W. Broten, S. C. Madden, and P. Friberg. **315**, 646, 47-F7 (1987)
- Anharmonicity and the Interstellar Polycyclic Aromatic Hydrocarbon Infrared Emission Spectrum. John R. Barker, L. J. Allamandola, and A. G. G. M. Tielens. **315**, L61, 45-E14 (1987)
- Ionization-regulated Star Formation in Magnetized Molecular Clouds. Ralph E. Pudritz and Joseph Silk. **316**, 213, 52-C10 (1987)
- Warm Dense Gas in Luminous Protostellar Regions: A Submillimeter and Far-Infrared CO Line Study. D. T. Jaffe, A. I. Harris, and R. Genzel. **316**, 231, 52-E1 (1987)
- The Dispersal of Dense Protostellar Material: NH₃ Hot Cores and Outflows in Sagittarius B2. S. N. Vogel, R. Genzel, and Patrick Palmer. **316**, 243, 52-F3 (1987)
- Bipolar Flows, Molecular Gas Disks, and the Collapse and Accretion of Rotating Interstellar Clouds. Alan P. Boss. **316**, 721, 60-A6 (1987)
- Laboratory Measurement of the Pure Rotational Spectrum of Vibrationally Excited HCO⁺ ($v = 1$) by Far-Infrared Laser Sideband Spectroscopy. Geoffrey A. Blake, K. B. Laughlin, R. S. Cohen, Kerry L. Busarow, and R. J. Saykally. **316**, L45, 56-D7 (1987)
- The CO $J = 2 \rightarrow 1$ Emission from the Interstellar Gas toward Zeta Ophiuchi. R. M. Crutcher and S. R. Federman. **316**, L71, 62-C2 (1987)
- L1689N: Misalignment between a Bipolar Outflow and a Magnetic Field. Abwyn Wootten and R. B. Loren. **317**, 220, 66-D1 (1987)
- Oxygen Chemistry of Shocked Interstellar Clouds. I. Rate Constants for Thermal and Nonthermal Internal Energy Distributions. A. F. Wagner and M. M. Graff. **317**, 423, 68-E11 (1987)
- Oxygen Chemistry of Shocked Interstellar Clouds. II. Effects of Nonthermal Internal Energy on Chemical Evolution. M. M. Graff and A. Dalgarno. **317**, 432, 68-F6 (1987)
- The Correlation of Spiral Arm Molecular Clouds with Cold Atomic Hydrogen. W. L. Peters and F. N. Bash. **317**, 646, 73-B8 (1987)
- The Equilibria of Rotating Isothermal Clouds. Masayoshi Kiguchi, Shinji Narita, Shoken M. Miyama, and Chushiro Hayashi. **317**, 830, 75-B5 (1987)
- The ¹²C/¹³C Isotope Ratio of the Interstellar Medium in the Neighborhood of the Sun. Isabel Hawkins and Michael Jura. **317**, 926, 76-C5 (1987)
- On the Synthesis of c-C₂H₂ in Interstellar Clouds. Nigel G. Adams and David Smith. **317**, L25, 71-B13 (1987)
- Molecular Spiral Structure in M51. K. Y. Lo, R. Ball, C. R. Masson, T. G. Phillips, S. Scott, and D. P. Woody. **317**, L63, 78-B11 (1987)
- CS Observations of L1551: No Rotating Disk. G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, and G. L. Grasdale. **317**, L95, 78-D13 (1987)
- Aperture Synthesis Maps of HDO Emission in Orion-KL. R. L. Plumbeck and M. C. H. Wright. **317**, L101, 78-E4 (1987)
- Detection of Vibration-Rotation Band Lines of Shocked CO in Orion. T. R. Geballe and Ron Garden. **317**, L107, 78-E9 (1987)
- Detection of Intense Unidentified Lines in TMC-1. Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito. **317**, L111, 78-E14 (1987)
- Laboratory Detection and Astronomical Identification of a New Free Radical, CCS(³ Σ^-). Shuji Saito, Kentarou Kawaguchi, Satoshi

- Yamamoto, Masatoshi Ohishi, Hiroko Suzuki, and Norio Kaifu. **317**, L115, 78-F3 (1987)
- Laboratory Detection of a New Carbon-Chain Molecule C_3S and Its Astronomical Identification. Satoshi Yamamoto, Shuji Saito, Kentaro Kawaguchi, Norio Kaifu, Hiroko Suzuki, and Masatoshi Ohishi. **317**, L119, 78-F7 (1987)
- Aperture Synthesis Observations of the Circumnuclear Ring in the Galactic Center. R. Güsten, R. Genzel, M. C. H. Wright, D. T. Jaffe, J. Stutzki, and A. I. Harris. **318**, 124, 80-C8 (1987)
- The 18 Centimeter OH Emission of IC 4553 (Arp 220). Willem A. Baan and Aubrey D. Haschick. **318**, 139, 80-D10 (1987)
- Excitation and Dissociation of Molecular Hydrogen in Shock Waves at Interstellar Densities. J. E. Dove, A. C. M. Rusk, P. H. Cribb, and P. G. Martin. **318**, 379, 83-A11 (1987)
- Models of Molecular Cloud Cores. III. A Multitransition Study of H_2CO . Lee G. Mundy, Neal J. Evans II, Ronald L. Snell, and Paul F. Goldsmith. **318**, 392, 83-B11 (1987)
- Hydrodynamical Processes in the Draco Molecular Cloud. Sten F. Odenwald and Lee J. Rickard. **318**, 702, 88-E7 (1987)
- Temperature and Density Structure of the Collapsing Core of G10.6 - 0.4. Eric R. Keto, Paul T. P. Ho, and Aubrey D. Haschick. **318**, 712, 88-F8 (1987)
- OH Outflows in Star-forming Regions. I. F. Mirabel, A. Ruiz, L. F. Rodriguez, and J. Cantó. **318**, 729, 89-A1 (1987)
- C-Type Transitions in Methyl Formate. Grant M. Plummer, Eric Herbst, and Frank C. De Lucia. **318**, 873, 90-E3 (1987)
- Fluorescent Molecular Hydrogen Emission from the Reflection Nebula NGC 2023. Ian Gatley, Tetsuo Hasegawa, Hiroko Suzuki, Ron Garden, Peter Brand, John Lightfoot, William Glencross, Haruyuki Okuda, and Tetsuya Nagata. **318**, L73, 92-D4 (1987)
- Level Population and Para/Ortho Ratio of Fluorescent H_2 in NGC 2023. Tetsuo Hasegawa, Ian Gatley, Ron P. Garden, Peter W. J. L. Brand, Masatoshi Ohishi, Masahiko Hayashi, and Norio Kaifu. **318**, L77, 92-D12 (1987)
- Para/Ortho Abundance Ratio of Molecular Hydrogen in NGC 2023. K. Takayanagi, K. Sakimoto, and K. Onda. **318**, L81, 92-E2 (1987)
- 1300 Micron Continuum and $C^{18}O$ Line Mapping of the Giant Molecular Cloud Cores in Orion, W49, and W51. F. Peter Schloerb, Ronald L. Snell, and P. R. Schwartz. **319**, 426, 97-G5 (1987)
- CCD Observations of Diffuse Interstellar Bands in Reflection Nebulae. Karl Jossafatsson and Theodore P. Snow. **319**, 436, 98-A1 (1987)
- CO Maps of the OMC-1 Outflow. C. R. Masson, K. Y. Lo, T. G. Phillips, A. I. Sargent, N. Z. Scoville, and D. P. Woody. **319**, 446, 98-A11 (1987)
- Molecular and Atomic Clouds Associated with Infrared Cirrus in Ursa Major. Hendrik Willem de Vries, Andreas Heithausen, and Patrick Thaddeus. **319**, 723, 103-A1 (1987)
- Mass, Luminosity, and Line Width Relations of Galactic Molecular Clouds. P. M. Solomon, A. R. Rivolo, J. Barrett, and A. Yahil. **319**, 730, 103-A8 (1987)
- High-Resolution Images of the L1551 Bipolar Outflow: Evidence for an Expanding, Accelerated Shell. G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, F. P. Schloerb, K. M. Strom, and G. L. Grasdale. **319**, 742, 103-B6 (1987)
- The Pleiades Cluster. IV. The Visit of a Molecular CO Cloud. Michel Breger. **319**, 754, 103-C9 (1987)
- The Leo Triplet Spiral Galaxy NGC 3628. II. VLA Observations of the Hydroxyl Absorption. J. T. Schmelz, W. A. Baan, and A. D. Haschick. **320**, 145, 109-E11 (1987)
- H I Superclouds in the Inner Galaxy. Bruce G. Elmegreen and Debra Meloy Elmegreen. **320**, 182, 110-B1 (1987)
- Molecular Hydrogen Line Emission in Seyfert Galactic Nuclei. J. Fischer, T. R. Geballe, Howard A. Smith, M. Simon, and J. W. V. Storey. **320**, 667, 117-B2 (1987)
- Cosmic-Ray-induced Photodestruction of Interstellar Molecules in Dense Clouds. A. Sternberg, A. Dalgarno, and S. Lepp. **320**, 676, 117-B11 (1987)
- The Megamaser Galaxy Markarian 273. I. VLA Observations of the Hydroxyl Emission. J. T. Schmelz, W. A. Baan, and A. D. Haschick. **321**, 225, 124-F6 (1987)
- Oblique Magnetohydrodynamic Shock Waves in Molecular Clouds. Mark Wardle and B. T. Draine. **321**, 321, 125-F8 (1987)
- A Survey of IRAS Point Sources in Taurus for High-Velocity Molecular Gas. Mark H. Heyer, Ronald L. Snell, Paul F. Goldsmith, and Philip C. Myers. **321**, 370, 126-C3 (1987)
- The Abundance of H_3^+ Ions in Dense Interstellar Clouds. S. Lepp, A. Dalgarno, and A. Sternberg. **321**, 383, 126-D4 (1987)
- Interpretation of Rotationally Excited Far-Infrared OH Emission in Orion-KL. G. J. Melnick, R. Genzel, and J. B. Lugten. **321**, 530, 127-G10 (1987)
- The Magnetic Evolution of the Taurus Molecular Clouds. I. Large-scale Properties. Mark H. Heyer, Frederick J. Vrba, Ronald L. Snell, F. P. Schloerb, Stephen E. Strom, Paul F. Goldsmith, and Karen M. Strom. **321**, 855, 133-G9 (1987)
- Are the High-Velocity Molecular Flows Really Clumpy? J. Cantó, L. F. Rodriguez, and G. Anglada. **321**, 877, 134-B11 (1987)
- Interaction of the High-Density Gas with the Bipolar Outflow in Cepheus A. José M. Torrelles, Paul T. P. Ho, Luis F. Rodriguez, Jorge Cantó, and James M. Moran. **321**, 884, 134-C4 (1987)
- The Rich Molecular Spectrum and the Rapid Outflow of OH 231.8 + 4.2. Mark Morris, Stéphane Guilloteau, Robert Lucas, and Alain Omont. **321**, 888, 134-C8 (1987)
- A Detailed Investigation of Proposed Gas-Phase Syntheses of Ammonia in Dense Interstellar Clouds. Eric Herbst, D. J. DeFrees, and A. D. McLean. **321**, 898, 134-D4 (1987)
- Detection of Interstellar PN: The First Identified Phosphorus Compound in the Interstellar Medium. B. E. Turner and John Bally. **321**, L75, 129-G11 (1987)
- Detection of Interstellar PN: The First Phosphorus-bearing Species Observed in Molecular Clouds. L. M. Ziurys. **321**, L81, 130-A2 (1987)
- Ions in Grain Mantles: The 4.62 Micron Absorption by OCN^- in W33A. Ruud J. A. Grim and J. Mayo Greenberg. **321**, L91, 130-A11 (1987)
- The Extraordinary CO Luminosity of the Far-Infrared Galaxy VII Zw 31: A Possible Proto-Galactic Disk? Leslie J. Sage and P. M. Solomon. **321**, L103, 137-A9 (1987)
- Giant Molecular Clouds in M31. S. N. Vogel, F. Boulanger, and R. Ball. **321**, L145, 137-D8 (1987)
- Optical Spectroscopy of IRAS Sources with Infrared Emission Bands: IRAS 21282 + 5050 and the Diffuse Interstellar Bands. Martin Cohen and B. F. Jones. **321**, L151, 137-E1 (1987)
- Widespread Strong Methanol Masers near H II Regions. R. P. Norris, J. L. Caswell, F. F. Gardner, and K. J. Wellington. **321**, L159, 137-E8 (1987)
- Molecules in Galaxies. V. CO Observations of Flocculent and Grand-Design Spirals. Antony A. Stark, Bruce G. Elmegreen, and Don Chance. **322**, 64, 138-F1 (1987)
- Large-Scale Galactic Dust Morphology and Physical Conditions from IRAS Observations. T. J. Soderroski, E. Dwek, M. G. Hauser, and F. J. Kerr. **322**, 101, 139-A10 (1987)
- H_2O Line Emission from Shocked Gas. David A. Neufeld and Gary J. Melnick. **322**, 266, 140-F12 (1987)
- Radio Recombination Lines from Fast Shocks in Molecular Clouds, with Application to Bipolar Flows. Christopher F. McKee and David J. Hollenbach. **322**, 275, 140-G7 (1987)
- Fluorescent Excitation of Interstellar H_2 . John H. Black and Ewine F. van Dishoeck. **322**, 412, 142-C11 (1987)
- Radio Observations of Carbon Monoxide toward Zeta Ophiuchi: Velocity Structure, Isotopic Abundances, and Physical Properties. William D. Langer, Alfred E. Glassgold, and Robert W. Wilson. **322**, 450, 142-G9 (1987)
- The CO Contents of Dwarf Irregular Galaxies. Linda J. Tacconi and Judith S. Young. **322**, 681, 147-C1 (1987)
- OH Megamasers in High-Luminosity IRAS Galaxies. I. F. Mirabel and D. B. Sanders. **322**, 688, 147-C8 (1987)
- A Composite CO Survey of the Entire Milky Way. T. M. Dame, H. Ungerechts, R. S. Cohen, E. J. de Geus, I. A. Grenier, J. May, D. C. Murphy, L.-A. Nyman, and P. Thaddeus. **322**, 706, 147-D13 (1987)
- The Crucial Role of Cooling in the Making of Molecular Clouds and Stars. Joel E. Tohline, Peter H. Bodenheimer, and Dimitris M. Christodoulou. **322**, 787, 148-D9 (1987)
- The Interstellar Clouds toward 3C 154 and 3C 353. S. R. Federman, Neal J. Evans II, R. F. Willson, E. Falgarone, F. Combes, and B. M. Scheufele. **322**, 960, 150-D4 (1987)
- Submillimeter and Far-Infrared Spectroscopy of M17 and S106: UV-Heated, Quiescent Molecular Gas? A. I. Harris, J. Stutzki, R. Genzel, J. B. Lugten, G. J. Stacey, and D. T. Jaffe. **322**, L49, 145-D6 (1987)
- Laboratory and Astronomical Detection of the Cyclic H_3H Radical. Satoshi Yamamoto, Shuji Saito, Masatoshi Ohishi, Hiroko Suzuki, Shin-Ichi Ishikawa, Norio Kaifu, and Akinori Murakami. **322**, L55, 145-D12 (1987)
- Hot Gas in the Nucleus of IC 342: Detection of $J = 3-2$ CO Emission. Paul T. P. Ho, Jean L. Turner, and Robert N. Martin. **322**, L67, 152-B3 (1987)
- CO Emission from Centaurus A. T. G. Phillips, B. N. Ellison, J. B. Keene, R. B. Leighton, R. J. Howard, C. R. Masson, D. B. Sanders, B. Veidt, and K. Young. **322**, L73, 152-B8 (1987)
- VLA Observations of H_2CO in Absorption against the Cosmic Background Radiation: Clumps in the S140 Molecular Cloud. Neal J. Evans II, Marc L. Kutner, and Lee G. Mundy. **323**, 145, 154-F3 (1987)

Interstellar: Molecules—Continued

- A Study of Clumping in the Cepheus OB 3 Molecular Cloud. *John S. Carr*. **323**, 170, 155-A1 (1987)
- An Expanding System of Molecular Clouds Surrounding λ Orionis. *Ronald J. Maddalena and Mark Morris*. **323**, 179, 155-A10 (1987)
- On Pumping the Strong Water Maser Sources. *Nikolaos D. Kylafis and Colin Norman*. **323**, 346, 156-G1 (1987)
- Gravitational Collapse in Molecular Cloud Cores around Ultracompact H II Regions: Two Candidates. *Eric R. Keto, Paul T. P. Ho, and Mark J. Reid*. **323**, L117, 164-C1 (1987)
- The C/CO Ratio in Dense Interstellar Clouds. *R. Gredel, S. Lepp, and A. Dalgarno*. **323**, L137, 164-D12 (1987)
- Laboratory Detection of HC_2NH^+ by Infrared Difference Frequency Laser Spectroscopy. *Sang K. Lee and T. Amano*. **323**, L145, 164-E4 (1987)
- A CO Survey of the Dark Nebulae in Perseus, Taurus, and Auriga. *H. Ungerechts and P. Thaddeus*. **63**, 645, 10-D6 (1987) (Abstr. in **313**, 930, 26-G13)
- Optical Survey of IRAS Fields in the Draco Cloud Region. *H. M. Johnson and A. R. Klemola*. **63**, 701, 11-C8 (1987) (Abstr. in **313**, 931, 26-G14)
- Molecular Clouds and Cloud Cores in the Inner Galaxy. *N. Z. Scoville, Min Su Yun, D. P. Clemens, D. B. Sanders, and W. H. Waller*. **63**, 821, 13-G12 (1987) (Abstr. in **314**, 832, 38-F8)
- A Palomar Observatory Sky Survey Atlas of Selected Molecular Clouds. *D. A. Klinglesmith and J. M. Hollis*. **64**, 127, 18-F5 (1987) (Abstr. in **315**, 731, 48-E12)
- Collisional Excitation of Interstellar Sulfur Dioxide. *Amedeo Palma*. **64**, 565, 25-A7 (1987) (Abstr. in **317**, 1003, 77-B6)
- The Laboratory Millimeter- and Submillimeter-Wave Spectrum of ^{13}C Methanol. *Todd Anderson, Eric Herbst, and Frank C. De Lucia*. **64**, 703, 27-E4 (1987) (Abstr. in **318**, 946, 91-C11)
- Galactic Center Molecular Clouds. I. Spatial and Spatial-Velocity Maps. *John Bally, Antony A. Stark, Robert W. Wilson, and Christian Henkel*. **65**, 13, 28-B2 (1987) (Abstr. in **319**, 1011, 106-A9)
- Collisional Excitation of Interstellar Cyclopropenylidene. *Sheldon Green, D. J. DeFrees, and A. D. McLean*. **65**, 175, 29-F11 (1987) (Abstr. in **319**, 1013, 106-A11)
- A Study of the Ground-State Hydroxyl Maser Emission Associated with 11 Regions of Star Formation. *Ralph A. Gaume and Robert L. Mutel*. **65**, 193, 31-A5 (1987) (Abstr. in **320**, 936, 120-B1)
- Systematic Properties of CO Emission from Galaxies. I. Luminosity Function. *Frances Verter*. **65**, 555, 37-A1 (1987) (Abstr. in **322**, 1075, 151-G1)
- Laboratory Spectra**
- Ultraviolet Doubly Excited Fe II Lines in the Laboratory and in the A-Type Star 21 Pegasi. *J. Adam, B. Baschek, S. Johansson, A. E. Nilsson, and T. Brage*. **312**, 337, 4-E6 (1987)
- Ion-Molecule Calculation of the Abundance Ratio of CCD to CCH in Dense Interstellar Clouds. *Eric Herbst, Nigel G. Adams, David Smith, and D. J. DeFrees*. **312**, 351, 4-F7 (1987)
- Experimental Study of Erosion of Methane Ice by Energetic Ions and Some Considerations for Astrophysics. *L. J. Lanzerotti, W. L. Brown, and K. J. Marcantonio*. **313**, 910, 26-F7 (1987)
- A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. *M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengtson, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan*. **313**, 920, 26-G3 (1987)
- Amorphous Carbon and the Unidentified Infrared Bands. *A. Borghesi, E. Bussoletti, and L. Colangeli*. **314**, 422, 32-G2 (1987)
- Laboratory and Astronomical Spectroscopy of C_3H_2 , the First Interstellar Organic Ring. *J. M. Vrilek, C. A. Gottlieb, and P. Thaddeus*. **314**, 716, 37-D8 (1987)
- The Laboratory Observation of the $J = 1-0$, $K = 0$ Transition of the H_2S^+ Ion. *Shuji Saito, Satoshi Yamamoto, and Takayoshi Amano*. **314**, L27, 33-C14 (1987)
- A 217.5 Nanometer Absorption Feature in the Spectrum of Small Silicate Particles. *T. M. Steel and W. W. Duley*. **315**, 337, 43-E8 (1987)
- Electron Impact Excitation of H_2 : Rydberg Band Systems and the Benchmark Dissociative Cross Section of H Lyman-Alpha. *D. E. Shemansky, J. M. Ajello, and D. T. Hall*. **315**, 408, 44-C14 (1987) (Orig. paper in **296**, 765, 98-D6)
- The Radio Spectrum of Cyclopropene. *J. M. Vrilek, C. A. Gottlieb, T. J. LePage, and P. Thaddeus*. **316**, 826, 61-B4 (1987)
- Laboratory Measurement of the Pure Rotational Spectrum of Vibrationally Excited HCO^+ ($\nu = 1$) by Far-Infrared Laser Sideband Spectroscopy. *Geoffrey A. Blake, K. B. Laughlin, R. C. Cohen, Kerry L. Busarow, and R. J. Saykally*. **316**, L45, 56-D7 (1987)
- Laboratory Detection and Astronomical Identification of a New Free Radical, $\text{CCS}^+(\Sigma^-)$. *Shuji Saito, Kentaro Kawaguchi, Satoshi Yamamoto, Masatoshi Ohishi, Hiroko Suzuki, and Norio Kaifu*. **317**, L115, 78-F3 (1987)
- Laboratory Detection of a New Carbon-Chain Molecule C_3S and Its Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, Kentaro Kawaguchi, Norio Kaifu, Hiroko Suzuki, and Masatoshi Ohishi*. **317**, L119, 78-F7 (1987)
- Collision-Induced Rototranslational Absorption Spectra of $\text{CH}_4\text{-CH}_4$ Pairs at Temperatures from 50 to 300 K. *Aleksandra Borysow and Lothar Frommhold*. **318**, 940, 91-C2 (1987)
- Infrared Spectrum of Quenched Carbonaceous Composite (QCC). II. A New Identification of the 7.7 and 8.6 Micron Unidentified Infrared Emission Bands. *Akira Sakata, Setsuko Wada, Takashi Onaka, and Alan T. Tokunaga*. **320**, L63, 114-E9 (1987)
- Absolute Oscillator Strengths for 108 Lines of Si I between 163 and 410 Nanometers. *Peter L. Smith, M. C. E. Huber, G. P. Tazzi, H. E. Griesinger, B. L. Cardon, and G. G. Lombardi*. **322**, 573, 144-B12 (1987)
- Laboratory and Astronomical Detection of the Cyclic H_3H Radical. *Satoshi Yamamoto, Shuji Saito, Masatoshi Ohishi, Hiroko Suzuki, Shin-Ichi Ishikawa, Norio Kaifu, and Akinori Murakami*. **322**, L55, 145-D12 (1987)
- Laboratory Detection of HC_2NH^+ by Infrared Difference Frequency Laser Spectroscopy. *Sang K. Lee and T. Amano*. **323**, L145, 164-E4 (1987)
- Laboratory Microwave Spectroscopy of the Vibrational Satellites for the ν_7 and $2\nu_7$ States of C_2H and Their Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, M. Guélin, J. Cernicharo, Hiroko Suzuki, and Masatoshi Ohishi*. **323**, L149, 164-E8 (1987)
- The Laboratory Millimeter- and Submillimeter-Wave Spectrum of ^{13}C Methanol. *Todd Anderson, Eric Herbst, and Frank C. De Lucia*. **64**, 703, 27-E4 (1987) (Abstr. in **318**, 946, 91-C11)
- The Near-Infrared Spectrum of the FeH Molecule. *John G. Phillips, Sumner P. Davis, Bo Lindgren, and Walter J. Baifour*. **65**, 721, 39-F2 (1987) (Abstr. in **322**, 1077, 151-G3)
- Line Formation**
- Observations of Globules and Dark Clouds in the CO $J = 3-2$ and $J = 2-1$ Lines. *L. W. Avery, Glenn J. White, I. P. Williams, and N. Cronin*. **312**, 848, 12-B13 (1987)
- On the Line Emission Profile and Line Source Function in the Case of Partial Redistribution. *R. Freire Ferrero*. **314**, 822, 38-E8 (1987)
- Radiative Bow Shock Models of Herbig-Haro Objects. *Patrick Hartigan, John Raymond, and Lee Hartmann*. **316**, 323, 53-D14 (1987)
- The Ultraviolet and Optical Emission-Line Spectrum of III Zw 77. *Gary J. Ferland and Donald E. Osterbrock*. **318**, 145, 80-E3 (1987)
- Stokes Profile Analysis and Vector Magnetic Fields. I. Inversion of Photospheric Lines. *A. Skumanich and B. W. Lites*. **322**, 473, 143-B8 (1987)
- Formation of Chromospheric Lines in Cool Dwarf Stars. *L. E. Cram and M. S. Giampapa*. **323**, 316, 156-D13 (1987)
- Line Identifications**
- Ultraviolet Doubly Excited Fe II Lines in the Laboratory and in the A-Type Star 21 Pegasi. *J. Adam, B. Baschek, S. Johansson, A. E. Nilsson, and T. Brage*. **312**, 337, 4-E6 (1987)
- Ultraviolet Spectra and Chromospheres of Cool Carbon Stars. *Hollis R. Johnson and Donald G. Luttermoser*. **314**, 329, 31-F9 (1987)
- New Lines of Ethylene and a Search for Methylene in IRC +10216. *D. M. Goldhaber, A. L. Betz, and J. J. Ottusch*. **314**, 356, 32-A13 (1987)
- Laboratory and Astronomical Spectroscopy of C_3H_2 , the First Interstellar Organic Ring. *J. M. Vrilek, C. A. Gottlieb, and P. Thaddeus*. **314**, 716, 37-D8 (1987)
- The Radio Spectrum of Cyclopropene. *J. M. Vrilek, C. A. Gottlieb, T. J. LePage, and P. Thaddeus*. **316**, 826, 61-B4 (1987)
- Detection of Intense Unidentified Lines in TMC-1. *Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito*. **317**, L111, 78-E14 (1987)
- C-Type Transitions in Methyl Formate. *Grant M. Plummer, Eric Herbst, and Frank C. De Lucia*. **318**, 873, 90-E3 (1987)
- Supernova 1987A: LTE Line Strengths as a Guide to Line Identifications. *David Branch*. **320**, L121, 121-D8 (1987)
- The Distribution of QSO Absorption System Column Densities: Evidence for a Single Population. *David Tytler*. **321**, 49, 122-F6 (1987)
- The Redshift Distribution of QSO Lyman-Alpha Absorption Systems. *David Tytler*. **321**, 69, 122-G12 (1987)
- Identification of Lines in the Satellite Ultraviolet: The Spectrum of

- Tau Scorpii. Charles R. Cowley and Donald R. Merritt. **321**, 553, 128-B10 (1987)
- Fluorescent Excitation of Interstellar H₂. John H. Black and Ewine F. van Dishoeck. **322**, 412, 142-C11 (1987)
- The Copernicus Ultraviolet Spectral Atlas of Sirius. John B. Rogerson, Jr. **63**, 369, 6-A13 (1987) (Abstr. in **312**, 966, 13-E7)
- High-Resolution Spectra of 24 Low-Redshift QSOs: The Properties of Mg II Absorption Systems. David Tytler, A. Boksenberg, Wallace L. W. Sargent, Peter Young, and Daniel Kunth. **64**, 667, 27-B8 (1987) (Abstr. in **318**, 945, 91-C10)
- The Laboratory Millimeter- and Submillimeter-Wave Spectrum of ¹³C Methanol. Todd Anderson, Eric Herbst, and Frank C. De Lucia. **64**, 703, 27-E4 (1987) (Abstr. in **318**, 946, 91-C11)
- An Atlas of Optical Spectrophotometry of Wolf-Rayet Carbon and Oxygen Stars. Ana V. Torres and Philip Massey. **65**, 459, 35-A2 (1987) (Abstr. in **321**, 1053, 136-A4)
- The Ultraviolet Spectrum of Beta Lyrae. Paolo A. Mazzali. **65**, 695, 39-D1 (1987) (Abstr. in **322**, 1077, 151-G3)
- The Near-Infrared Spectrum of the FeH Molecule. John G. Phillips, Sumner P. Davis, Bo Lindgren, and Walter J. Balfour. **65**, 721, 39-F2 (1987) (Abstr. in **322**, 1077, 151-G3)
- Line Profiles**
- Variability of the Optical Spectrum of NGC 5548 and Evidence for a Multiple-Component Broad-Line Region. Bradley M. Peterson. **312**, 79, 1-G11 (1987)
- Magnetic Field Measurements on the Sun and Implications for Stellar Magnetic Field Observations. Wei-Hsin Sun, Mark S. Giampapa, and Simon P. Worden. **312**, 930, 13-B1 (1987)
- The Impact of the Pressure Shift of Hydrogen Lines on "Relativistic" Masses of White Dwarfs. B. Grabowski, J. Madej, and J. Halenka. **313**, 750, 25-A8 (1987)
- The "SEI" Method for Accurate and Efficient Calculations of Line Profiles in Spherically Symmetric Stellar Winds. H. J. G. L. M. Lamers, M. Cerruti-Sola, and M. Perinotto. **314**, 726, 37-E6 (1987)
- Solar Luminosity Variation. V. The Photospheric Lines 1976-1985. W. Livingston and L. Wallace. **314**, 808, 38-D8 (1987)
- On the Line Emission Profile and Line Source Function in the Case of Partial Redistribution. R. Freire Ferrero. **314**, 822, 38-E8 (1987)
- Radiative Bow Shock Models of Herbig-Haro Objects. Patrick Hartigan, John Raymond, and Lee Hartmann. **316**, 323, 53-D14 (1987)
- Broad, Variable Absorption Lines in the Seyfert Galaxy NGC 3516: Probing the Structure of the Emission-Line Regions. G. Mark Voit, J. Michael Shull, and Mitchell C. Begelman. **316**, 573, 58-C5 (1987)
- Ultraviolet Observations of Extreme Variability in the Stellar Wind of ϵ Persei. Raman K. Prinja, Ian D. Howarth, and Huib F. Henrichs. **317**, 389, 68-B11 (1987)
- Rapid Variability of P Cygni Lines in Massive X-Ray Binaries. Timothy R. Kallman, Richard McCray, and G. Mark Voit. **317**, 746, 74-B12 (1987)
- Stokes Profile Analysis and Vector Magnetic Fields. III. Extended Temperature Minima of Sunspot Umbrae as Inferred from Stokes Profiles of Mg I $\lambda 4471$. B. W. Lites, A. Skumanich, D. E. Rees, G. A. Murphy, and M. Carlsson. **318**, 930, 91-B6 (1987)
- The Velocity Distribution of Quasar/AGN Broad Emission Line Clouds. R. C. Puetter and E. N. Hubbard. **320**, 85, 109-A6 (1987)
- The Broad-Line Region at the Center of the Galaxy. T. R. Geballe, R. Wade, K. Krisciunas, I. Gatley, and M. C. Bird. **320**, 562, 115-F12 (1987)
- The Nonradial Oscillations of ϵ Persei. II. Nonlinear Characteristics. Myron A. Smith, Alexander W. Fullerton, and John R. Percy. **320**, 768, 118-B10 (1987)
- Forbidden Line and H α Profiles in T Tauri Star Spectra: A Probe of Anisotropic Mass Outflows and Circumstellar Disks. Suzan Edwards, Sylvie Cabrit, Stephen E. Strom, Ingeborg Heyer, Karen M. Strom, and E. Anderson. **321**, 473, 127-C10 (1987)
- Doppler Images of Rotating Stars Using Maximum Entropy Image Reconstruction. Steven S. Vogt, G. Donald Penrod, and Artie P. Hatzes. **321**, 496, 127-E5 (1987)
- Emission-Line Variability and the Broad-Line Region of Quasi-stellar Objects. I. Time Scales and Photon Densities. Wei Zheng, E. Margaret Burbidge, Harding E. Smith, Ross D. Cohen, and Steven E. Bradley. **322**, 164, 139-F5 (1987)
- An Analysis of the Photospheric Line Profiles in F, G, and K Super-giants. David F. Gray and C. G. Toner. **322**, 360, 141-G1 (1987)
- Impulsive H α Diagnostics of Electron-Beam-Heated Solar Flare Model Chromospheres. Richard C. Canfield and Kenneth G. Gayley. **322**, 999, 150-G10 (1987)
- IUE Observations of the Dwarf Nova HL Canis Majoris and the Winds of Cataclysmic Variables. Christopher W. Mauche and John C. Raymond. **323**, 690, 162-C6 (1987)
- Recurrent Episodic Mass Loss in a B2e Star: 66 Ophiuchi, 1982-1985. C. A. Grady, George Sonneborn, Chi-Chao Wu, and H. F. Henrichs. **65**, 673, 39-A2 (1987) (Abstr. in **322**, 1077, 151-G3)
- The Ultraviolet Spectrum of Beta Lyrae. Paolo A. Mazzali. **65**, 695, 39-D1 (1987) (Abstr. in **322**, 1077, 151-G3)
- Luminosity Function**
- Dynamical Friction and Evolution of the Luminosity Function in Clusters of Galaxies. A. Kashlinsky. **312**, 497, 8-C13 (1987)
- Broad-Band Properties of the CIA Seyfert Galaxies. I. Radio Properties. R. A. Edelson. **313**, 651, 24-A1 (1987)
- The Integrated Ultraviolet Radiation Field from QSOs. Jill Bechtold, Ray J. Weymann, Zuo Lin, and Matthew A. Malkan. **315**, 180, 42-A4 (1987)
- The Radio Luminosity Function of Optically Selected Quasars. Herman L. Marshall. **316**, 84, 50-G14 (1987)
- Chemical Enrichment of Halo Protoclusters with Differing Stellar Mass Functions. Graeme H. Smith and Robert D. McClure. **316**, 206, 52-C3 (1987)
- Theoretical Stellar Luminosity Functions and the Ages and Compositions of Globular Clusters. Stephen J. Ratcliff. **318**, 196, 81-A13 (1987)
- Interpretation of Deep Counts of Radio Sources. L. Danese, G. De Zotti, A. Franceschini, and L. Toffolatti. **318**, 115, 85-B2 (1987)
- Surveys of Fields around Quasars. IV. Luminosity of Galaxies at $z \geq 0.6$ and Preliminary Evidence for the Evolution of the Environment of Radio-loud Quasars. H. K. C. Yee and Richard F. Green. **319**, 28, 93-C12 (1987)
- Evolution of Very Low Mass Stars and Brown Dwarfs. II. The Population II. Francesca D'Antona. **320**, 653, 117-A1 (1987)
- The Marginal Gravitational Lensing. Israel Kover. **321**, 686, 132-A13 (1987)
- Chemical Enrichment of Halo Protoclusters with Differing Stellar Mass Functions: Erratum. Graeme H. Smith and Robert D. McClure. **322**, 1074, 151-F12 (1987) (Orig. paper in **316**, 206, 52-C3)
- Mass-to-Light Ratios of Binary Galaxies. III. Analysis. Linda Y. Schweizer. **64**, 427, 22-E4 (1987) (Abstr. in **316**, 860, 61-E2)
- Magnetic Fields**
- The Structure and Dynamics of Bok Globule B335. Margaret A. Frerking, William D. Langer, and Robert W. Wilson. **313**, 320, 18-D10 (1987)
- The Faraday Rotation of Cygnus A: Magnetic Fields in Cluster Gas. J. W. Dreher, C. L. Carilli, and R. A. Perley. **316**, 611, 58-F7 (1987)
- Inhomogeneous Cosmological Models: New Exact Solutions with Dust, Isotropic Radiation, and Electromagnetic Field. Nazira Tomimura and Ioav Waga. **317**, 52, 64-E2 (1987)
- Resonant Raman-Cyclotron Scattering in Very Strong Magnetic Fields. Edouard Miska and Dominique Miska. **317**, 282, 67-A7 (1987)
- The Hydrogen Molecular Ion in an Arbitrary Homogeneous Magnetic Field. D. R. Brighman and J. M. Wadehra. **317**, 865, 75-D14 (1987)
- Nonlinear Radiative Condensation in a Sheared Magnetic Field. G. Van Hoven, L. Sparks, and D. D. Schnack. **317**, 191, 78-D9 (1987)
- A Radiative Bow Shock Wave (?) Driven by Nuclear Ejecta in a Seyfert Galaxy. Andrew S. Wilson and James S. Ulvestad. **319**, 105, 94-B11 (1987)
- The Magnetic Field in Star-forming Large Globules. Klaus-Werner Hodapp. **319**, 842, 104-B13 (1987)
- Quantized Synchrotron Radiation in Strong Magnetic Fields. Alice K. Harding and Robert Preece. **319**, 939, 105-C1 (1987)
- A Shocked-Jet Model of the Galactic Center Bridge and the Radio Arc. Yoshiaki Sofue and Mitsuaki Fujimoto. **319**, 173, 107-D11 (1987)
- Analytic and Numerical Calculations of Quantum Synchrotron Spectra from Relativistic Electron Distributions. J. J. Brainerd and V. Petrosian. **320**, 703, 117-D11 (1987)
- Quantum Synchrotron Spectra from Semirelativistic Electrons in Teragauss Magnetic Fields. J. J. Brainerd. **320**, 714, 117-E8 (1987)
- The Discovery of Near-Infrared Polarized Cyclotron Emission in the Intermediate Polar BG Canis Minoris. Steven C. West, Graham Berriman, and Gary D. Schmidt. **322**, 135, 145-C7 (1987)
- Ohmic Decay of Crustal Neutron Star Magnetic Fields. Yeming Sang and G. Chanmugam. **323**, 161, 158-E2 (1987)
- Masers**
- Infrared Spectroscopy of IRC +10420. John D. Fix and Michael L. Cobb. **312**, 290, 4-B1 (1987)
- Pumping the Stellar Hydroxyl Maser. Dale F. Dickinson. **313**, 408, 19-D13 (1987)
- Infrared Speckle Interferometry and Imaging of Several OH/IR Stars. Michael L. Cobb and John D. Fix. **315**, 323, 43-D10 (1987)
- SiO Cooling Instability in the Envelopes of Cool Giant Stars. David O. Mchmore, Joseph A. Nuth III, and Robert E. Stencel. **315**, 1141, 49-F10 (1987)

Masers—Continued

- A Water Maser Associated with EU Andromedae: A Carbon Star Near an Oxygen-rich Circumstellar Shell. *Priscilla J. Benson and Irene R. Little-Marelin*. **316**, L37, 56-C13 (1987)
- Cylindrical Astrophysical Maser Models: Polarization Due to Magnetic Fields. *L. R. Western*. **317**, 858, 75-D7 (1987)
- Study of the H₂A (86 GHz) Recombination Line in W3(OH). *Wm. J. Welch and J. Marr*. **317**, L21, 71-B10 (1987)
- The Distribution of Maser Emission in OH/IR Stars. *Alan D. Welty, John D. Fix, and Robert L. Mutel*. **318**, 852, 90-C10 (1987)
- Zw 15107 + 0724 and the Family of OH Megamasers. *Willem A. Baan, Christian Henkel, and Aubrey D. Haschick*. **320**, 154, 109-F6 (1987)
- H₂O Maser Emission from the Nuclei of NGC 253 and M51. *Paul T. P. Ho, Robert N. Martin, Christian Henkel, and Jean L. Turner*. **320**, 663, 117-A12 (1987)
- Water Masers Associated with Low-Mass Stars: A Survey of the Rho Ophiuchi Infrared Cluster. *B. A. Wilking and M. J. Claussen*. **320**, L133, 121-E4 (1987)
- The Megamaser Galaxy Markarian 273. I. VLA Observations of the Hydroxyl Emission. *J. T. Schmelz, W. A. Baan, and A. D. Haschick*. **321**, 225, 124-F6 (1987)
- Widespread Strong Methanol Masers near H II Regions. *R. P. Norris, J. L. Caswell, F. F. Gardner, and K. J. Wellington*. **321**, L159, 137-E8 (1987)
- Evolution of the Axial Electron Cyclotron Maser Instability, with Applications to Solar Microwave Spikes. *Loukas Vlahos and Phillip Sprangle*. **322**, 463, 143-A10 (1987)
- OH Megamasers in High-Luminosity IRAS Galaxies. *I. F. Mirabel and D. B. Sanders*. **322**, 688, 147-C8 (1987)
- On Pumping the Strong Water Maser Sources. *Nikolaos D. Kylafis and Colin Norman*. **323**, 346, 156-G1 (1987)
- Mass Loss from Evolved Stars. VII. OH Maser Shell Radii and Mass-Loss Rates for OH/IR Stars. *Nathan Netzer and G. R. Knapp*. **323**, 734, 162-F12 (1987)
- High-Excitation SiO Masers in Evolved Stars. *P. R. Jewell, Dale F. Dickinson, L. E. Snyder, and D. P. Clemens*. **323**, 749, 163-A1 (1987)
- H₂O Masers in Circumstellar Envelopes. *Adair P. Lane, K. J. Johnston, P. F. Bowers, J. H. Spencer, and P. J. Diamond*. **323**, 756, 163-A8 (1987)
- Water Maser Emission toward V788 Cygni, A Carbon Star. *Y. Nakada, H. Izumiura, T. Onaka, O. Hashimoto, N. Ukita, S. Deguchi, and T. Tanabe*. **323**, L77, 158-F6 (1987)
- Detection of H¹³CN Maser Emission from the Ground State toward Y Canum Venaticorum. *Hideyuki Izumiura, Nobuharu Ukita, Ryohei Kawabe, Norio Kaifu, Takashi Tsuji, Wasaburo Umno, and Kouichi Koyama*. **323**, L81, 158-F10 (1987)
- A Study of the Ground-State Hydroxyl Maser Emission Associated with II Regions of Star Formation. *Ralph A. Gaume and Robert L. Mutel*. **323**, 193, 31-A5 (1987) (Abstr. in **320**, 936, 120-B1)
- Meteoroids and Meteorites**
- Large Negative ⁵⁰Ti Anomalies in Refractory Inclusions from the Murchison Carbonaceous Chondrite: Evidence for Incomplete Mixing of Neutron-rich Supernova Ejecta into the Solar System. *Richard W. Hinton, Andrew M. Davis, and Debra E. Scatena-Wachel*. **313**, 420, 19-E12 (1987)
- Evidence in Meteorites for an Active Early Sun. *M. W. Caffee, C. M. Hohenberg, T. D. Swindle, and J. N. Goswami*. **313**, L31, 21-C3 (1987)
- Chemical Condensation in the Outflowing Matter from the Proto-Sun and Its Application to Meteorites. *B. M. P. Trivedi*. **320**, 430, 112-F11 (1987)
- Evidence from Meteor Patrol Photographs for a Nonastronomical Origin of the Reported Optical Flashes in Perseus. *I. Halliday, P. A. Feldman, and A. T. Blackwell*. **320**, L153, 121-F11 (1987)
- ¹⁶O Excesses in Murchison and Murray Hibonites: A Case Against a Late Supernova Injection Origin of Isotopic Anomalies in O, Mg, Ca, and Ti. *A. J. Fahey, J. N. Goswami, K. D. McKeegan, and E. K. Zinner*. **323**, L91, 158-G5 (1987)
- Molecular Processes**
- Emission from CO Band Heads in Young Stellar Objects. *T. R. Geballe and S. E. Persson*. **312**, 297, 4-B8 (1987)
- Rate of CH₃⁺ + H₂ → CH₃ + H₂ and Role of Electronic Transitions in Other Radiative Association Processes. *David R. Bates*. **312**, 363, 4-G5 (1987)
- Can Gas Phase Reactions Produce Complex Oxygen-containing Molecules in Dense Interstellar Clouds? A Revision of Some Important Radiative Association Rate Coefficients. *Eric Herbst*. **313**, 867, 26-C4 (1987)
- Long Carbon Chain Molecules in Circumstellar Shells. *H. W. Kroto, J. R. Heath, S. C. O'Brien, R. F. Curl, and R. E. Smalley*. **314**, 352, 32-A9 (1987)
- Singlet Systems of Zirconium Oxide. *M. Afaf*. **314**, 415, 32-F8 (1987)
- Initial Vibrational and Rotational Yields from Subexcitation Electrons in Molecular Hydrogen. *Daryl A. Douthat*. **314**, 419, 32-F13 (1987)
- Ion-Dipolar Molecule Rate Coefficients. *Wm. Lowell Morgan and David R. Bates*. **314**, 817, 38-E3 (1987)
- Molecular Abundances in OMC-1: The Chemical Composition of Interstellar Molecular Clouds and the Influence of Massive Star Formation. *Geoffrey A. Blake, E. C. Sutton, C. R. Masson, and T. G. Phillips*. **315**, 621, 47-D9 (1987)
- Anharmonicity and the Interstellar Polycyclic Aromatic Hydrocarbon Infrared Emission Spectrum. *John R. Barker, L. J. Allamandola, and A. G. G. M. Tielens*. **315**, L61, 45-E14 (1987)
- SiO Cooling Instability in the Envelopes of Cool Giant Stars. *David O. Muchmore, Joseph A. Nuth III, and Robert E. Stencel*. **315**, L141, 49-F10 (1987)
- Fluorescence Efficiency Factors for Ionized Water Vapor. *Barry L. Lutz*. **315**, L147, 49-G2 (1987)
- The Radio Spectrum of Cyclopropane. *J. M. Vrtilik, C. A. Gottlieb, T. J. LePage, and P. Thaddeus*. **316**, 826, 61-B4 (1987)
- Collisional Excitation of an Asymmetric Rotor, Silicon Dicarbide. *Amedeo Palma and Sheldon Green*. **316**, 830, 61-B9 (1987)
- Oxygen Chemistry of Shocked Interstellar Clouds. I. Rate Constants for Thermal and Nonthermal Internal Energy Distributions. *A. F. Wagner and M. M. Graff*. **317**, 423, 68-E11 (1987)
- Oxygen Chemistry of Shocked Interstellar Clouds. II. Effects of Non-thermal Internal Energy on Chemical Evolution. *M. M. Graff and A. Dalgarno*. **317**, 432, 68-F6 (1987)
- Statistical Equilibrium in Cometary C₂. IV. A 10 Level Model Including Singlet-Triplet Transitions. *K. S. Krishna Swamy and C. R. O'Dell*. **317**, 543, 69-G7 (1987)
- The Hydrogen Molecular Ion in an Arbitrary Homogeneous Magnetic Field. *D. R. Brighman and J. M. Wadehra*. **317**, 865, 75-D14 (1987)
- Spectrophotometry of Comets Giacobini-Zinner and Halley. *Stephen C. Tegler and C. R. O'Dell*. **317**, 987, 77-A2 (1987)
- On the Synthesis of c-C₃H₂ in Interstellar Clouds. *Nigel G. Adams and David Smith*. **317**, L25, 71-B13 (1987)
- Detection of Vibration-Rotation Band Lines of Shocked CO in Orion. *T. R. Geballe and Ron Garden*. **317**, L107, 78-E9 (1987)
- Laboratory Detection and Astronomical Identification of a New Free Radical, CCS(Σ⁻). *Shuji Saito, Kentarou Kawaguchi, Satoshi Yamamoto, Masatoshi Ohishi, Hiroko Suzuki, and Norio Kaifu*. **317**, L115, 78-F3 (1987)
- Laboratory Detection of a New Carbon-Chain Molecule C₃S and Its Astronomical Identification. *Satoshi Yamamoto, Shuji Saito, Kentarou Kawaguchi, Norio Kaifu, Hiroko Suzuki, and Masatoshi Ohishi*. **317**, L119, 78-F7 (1987)
- Hydrogen Molecules and the Radiative Cooling of Pregalactic Shocks. *Paul R. Shapiro and Hyesung Kang*. **318**, 32, 79-C8 (1987)
- Excitation and Dissociation of Molecular Hydrogen in Shock Waves at Interstellar Densities. *J. E. Dove, A. C. M. Rusk, P. H. Cribb, and P. G. Martin*. **318**, 379, 83-A11 (1987)
- C-Type Transitions in Methyl Formate. *Grant M. Plummer, Eric Herbst, and Frank C. De Lucia*. **318**, 873, 90-E3 (1987)
- Collision-induced Rototranslational Absorption Spectra of CH₄-CH₄ Pairs at Temperatures from 50 to 300 K. *Aleksandra Borysow and Lothar Frommhold*. **318**, 940, 91-C2 (1987)
- Fluorescent Molecular Hydrogen Emission from the Reflection Nebula NGC 2023. *Ian Gatley, Tetsuo Hasegawa, Hiroko Suzuki, Ron Garden, Peter Brand, John Lightfoot, William Glencross, Haruyuki Okuda, and Tetsuya Nagata*. **318**, L73, 92-D4 (1987)
- Level Population and Para/Ortho Ratio of Fluorescent H₂ in NGC 2023. *Tetsuo Hasegawa, Ian Gatley, Ron P. Garden, Peter W. J. L. Brand, Masatoshi Ohishi, Masahiko Hayashi, and Norio Kaifu*. **318**, L77, 92-D12 (1987)
- Para/Ortho Abundance Ratio of Molecular Hydrogen in NGC 2023. *K. Takayanagi, K. Sakimoto, and K. Onda*. **318**, L81, 92-E2 (1987)
- Collision-induced Rototranslational Absorption Spectra of N₂-N₂ Pairs for Temperatures from 50 to 300 K: Erratum. *Aleksandra Borysow and Lothar Frommhold*. **320**, 437, 112-G4 (1987) (Orig. paper in **311**, 1043, 160-C6)
- Cosmic-Ray-induced Photodestruction of Interstellar Molecules in Dense Clouds. *A. Sternberg, A. Dalgarno, and S. Lepp*. **320**, 676, 117-B11 (1987)
- Collisional Charging of Interstellar Grains. *B. T. Draine and Brian Sutin*. **320**, 803, 118-E5 (1987)
- Polyoxymethylene in Comet Halley. *W. F. Huebner, D. C. Boice, and C. M. Sharp*. **320**, L149, 121-F7 (1987)
- A Detailed Investigation of Proposed Gas-Phase Syntheses of Ammonia in Dense Interstellar Clouds. *Eric Herbst, D. J. DeFrees, and A. D. McLean*. **321**, 898, 134-D4 (1987)
- Molecule Formation in Quasar Broad-Line Cloud Gas. *T. Kallman, S.*

- Lepp, and P. Giovannoni. **321**, 907, 134-D13 (1987)
- Ion-Dipolar Molecule Rate Coefficients: Erratum. Wm. Lowell Morgan and David R. Bates. **321**, 1049, 136-A1 (1987) (Orig. paper in **314**, 817, 38-E3)
- The Role of Aqueous Chemistry in Determining the Composition and Cloud Structure of the Upper Troposphere of Uranus. Barbara E. Carlson, Michael J. Prather, and William B. Rossow. **321**, L97, 130-B3 (1987)
- H₂O Line Emission from Shocked Gas. David A. Neufeld and Gary J. Melnick. **322**, 266, 140-F12 (1987)
- Fluorescent Excitation of Interstellar H₂. John H. Black and Ewine F. van Dishoeck. **322**, 412, 142-C11 (1987)
- Cloud Chemistry on Jupiter. Barbara E. Carlson, Michael J. Prather, and William B. Rossow. **322**, 559, 144-A11 (1987)
- OH and CH Continuous Opacity in Solar and Stellar Atmospheres. Robert L. Kurucz, Ewine F. van Dishoeck, and S. P. Tarafdar. **322**, 992, 150-F13 (1987)
- Laboratory and Astronomical Detection of the Cyclic H₃H Radical. Satoshi Yamamoto, Shuji Saito, Masatoshi Ohishi, Hiroko Suzuki, Shin-Ichi Ishikawa, Norio Kaifu, and Akinori Murakami. **322**, L55, 145-D12 (1987)
- Photochemistry and Molecular Ions in Oxygen-rich Circumstellar Envelopes. G. A. Mamon, A. E. Glassgold, and A. Omont. **323**, 306, 156-D3 (1987)
- Vibrational-Rotational Intensities for the $X^1\Sigma^+$ State of Al H and Al D. R. H. Tipping, A. Lopez Piñero, and C. Chackerian, Jr. **323**, 810, 163-E12 (1987)
- Laboratory Microwave Spectroscopy of the Vibrational Satellites for the ν_7 and $2\nu_7$ States of C₄H and Their Astronomical Identification. Satoshi Yamamoto, Shuji Saito, M. Güellin, J. Cernicharo, Hiroko Suzuki, and Masatoshi Ohishi. **323**, L149, 164-E8 (1987)
- Collisional Excitation of Interstellar Sulfur Dioxide. Amedeo Palma. **64**, 565, 25-A7 (1987) (Abstr. in **317**, 1003, 77-B6)
- The Laboratory Millimeter- and Submillimeter-Wave Spectrum of ¹³C Methanol. Todd Anderson, Eric Herbst, and Frank C. De Lucia. **64**, 703, 27-E4 (1987) (Abstr. in **318**, 946, 91-C11)
- Collisional Excitation of Interstellar Cyclopropenylidene. Sheldon Green, D. J. DeFrees, and A. D. McLean. **65**, 175, 29-F11 (1987) (Abstr. in **319**, 1013, 106-A11)
- The Near-Infrared Spectrum of the FeH Molecule. John G. Phillips, Sumner P. Davis, Bo Lindgren, and Walter J. Balfour. **65**, 721, 39-F2 (1987) (Abstr. in **322**, 1077, 151-G3)
- Nebulae: Abundances**
- Observations of Globules and Dark Clouds in the CO $J = 3-2$ and $J = 2-1$ Lines. L. W. Avery, Glenn J. White, I. P. Williams, and N. Cronin. **312**, 848, 12-B13 (1987)
- The Planetary Nebula NGC 3918. R. E. S. Clegg, J. P. Harrington, M. J. Barlow, and J. R. Walsh. **314**, 551, 35-E7 (1987)
- On the Chemical Homogeneity of the 30 Doradus H II Region and a Local Enrichment by Wolf-Rayet Stars. Michael Rosa and John S. Mathis. **317**, 163, 65-F11 (1987)
- H II Region Abundances in Seyfert Galaxies. I. N. Evans and M. A. Dopita. **319**, 662, 102-B12 (1987)
- Nitrogen Abundances in the Amorphous Galaxy NGC 5253. Jeremy R. Walsh and Jean-René Roy. **319**, L57, 107-C9 (1987)
- Physical Parameters for 12 Planetary Nebulae and Their Central Stars in the Magellanic Clouds. Lawrence H. Aller, Charles D. Keyes, Stephen P. Maran, Theodore R. Gull, Andrew G. Michalitsianos, and Theodore P. Stecher. **320**, 159, 109-F12 (1987)
- Far-Infrared Measurements of N/O in H II Regions: Evidence for Enhanced CN Process Nucleosynthesis in the Inner Galaxy. D. F. Lester, H. L. Dinerstein, M. W. Werner, D. M. Watson, R. Genzel, and J. W. V. Storey. **320**, 573, 116-A1 (1987)
- The Rich Molecular Spectrum and the Rapid Outflow of OH 231.8 + 4.2. Mark Morris, Stéphane Guilloteau, Robert Lucas, and Alain Omont. **321**, 888, 134-C8 (1987)
- Airborne Spectrophotometry of Eta Carinae from 4.5 to 7.5 Microns and a Model for Source Morphology. Ray W. Russell, David K. Lynch, John A. Hackwell, Richard J. Rudy, George S. Rossano, and M. W. Castelar. **321**, 937, 134-G1 (1987)
- Predicted [Ni II] Infrared Line Strengths in the Crab Nebula and IC 443. Richard B. C. Henry. **322**, 399, 142-B12 (1987)
- The Ionization Structure of Planetary Nebulae. VII. New Observations of the Ring Nebula. Timothy Barker. **322**, 922, 150-A6 (1987)
- Measurements of the ³He Abundance in the Interstellar Medium. T. M. Bania, Robert T. Rood, and T. L. Wilson. **323**, 30, 153-D3 (1987)
- A Spectroscopic Survey of 51 Planetary Nebulae. L. H. Aller and C. D. Keyes. **65**, 405, 34-A1 (1987) (Abstr. in **321**, 1051, 136-A2)
- Nebulae: Crab Nebula**
- A Scanning Modulation Collimator Observation of the High Energy X-Ray Source in the Crab Nebula. R. M. Pelling, W. S. Paciesas, L. E. Peterson, K. Makishima, M. Oda, Y. Ogawara, and S. Miyamoto. **319**, 416, 97-F7 (1987)
- Gamma-Ray Observations of the Crab Region Using a Coded-Aperture Telescope. M. L. McConnell, P. P. Dunphy, D. J. Forrest, E. L. Chupp, and A. Owens. **321**, 543, 128-A13 (1987)
- Predicted [Ni II] Infrared Line Strengths in the Crab Nebula and IC 443. Richard B. C. Henry. **322**, 399, 142-B12 (1987)
- Nebulae: General**
- The Structure and Dynamics of Bok Globule B335. Margaret A. Frerking, William D. Langer, and Robert W. Wilson. **313**, 320, 18-D10 (1987)
- Far-Infrared Detection of a Circumstellar Dust Torus around Sharpless 106. Paul M. Harvey, Daniel F. Lester, and Marshall Joy. **316**, L75, 62-C5 (1987)
- Thermal Emission from Bok Globules. Man Hoi Lee and C. Rogers. **317**, 197, 66-B8 (1987)
- The Equilibria of Rotating Isothermal Clouds. Masayoshi Kiguchi, Shinji Narita, Shoken M. Miyama, and Chushiro Hayashi. **317**, 830, 75-B5 (1987)
- Jets from Young Stars: CCD Imaging, Long-Slit Spectroscopy, and Interpretation of Existing Data. Reinhard Mundt, Edward W. Bruzel, and Thomas Bührke. **319**, 275, 96-A6 (1987)
- Emission-Line Ratios for O III in Gaseous Nebulae and a Comparison between Theory and Observation. F. P. Kennan and K. M. Aggarwal. **319**, 403, 97-E7 (1987)
- Near-Infrared H₂ Emission from Herbig-Haro Objects. I. A Survey of Low-Excitation Objects. Richard D. Schwartz, Martin Cohen, and Peredur M. Williams. **322**, 403, 142-C2 (1987)
- A View of the Galactic H α Background: $208^\circ \leq l \leq 218^\circ$; $-2^\circ \leq b \leq +8^\circ$. R. J. Reynolds. **323**, 118, 154-D2 (1987)
- Fragmentation of Rapidly Rotating Gas Clouds. I. A Universal Criterion for Fragmentation. Izumi Hachisu, Joel E. Tohline, and Yoshiharu Eriguchi. **323**, 592, 161-C1 (1987)
- A CO Survey of the Dark Nebulae in Perseus, Taurus, and Auriga. H. Ungerechts and P. Thaddeus. **63**, 645, 10-D6 (1987) (Abstr. in **313**, 930, 26-G13)
- Nebulae: H II Regions**
- The Bright-Rimmed Molecular Cloud around S140 IRS. II. Bipolar Outflow from S140 IRS 1. M. Hayashi, T. Hasegawa, T. Omodaka, S. S. Hayashi, and R. Miyawaki. **312**, 327, 4-D10 (1987)
- The Circumstellar Envelope of W3(OH): NH₃ Observations. Mark J. Reid, Philip C. Myers, and John H. Bieging. **312**, 830, 12-A9 (1987)
- Recombination Spectroscopy of Star-Formation Regions in the Nucleus of M83. Jean L. Turner, Paul T. P. Ho, and Sara C. Beck. **313**, 644, 23-G2 (1987)
- An Active Star Formation Site in RCW 108. Steven Straw, A. R. Hyland, Terry J. Jones, Paul M. Harvey, Bruce A. Wilking, and Marshall Joy. **314**, 283, 31-B12 (1987)
- Where Massive Stars Form: Associated Radio H II Regions and CO Clouds in the Northern Milky Way. W. H. Waller, D. P. Clemens, D. B. Sanders, and N. Z. Scoville. **314**, 397, 32-E4 (1987)
- Small-Scale Structure and Chemical Differential in the Central Regions of the Sagittarius B2 Molecular Cloud. Paul F. Goldsmith, Ronald L. Snell, T. Hasegawa, and N. Ukita. **314**, 525, 35-C6 (1987)
- Compact Continuum Radio Sources in the Orion Nebula. Guido Garay, James M. Moran, and Mark J. Reid. **314**, 535, 35-D2 (1987)
- Far-Infrared Spectroscopy of Star Formation Regions in M82. P. B. Duffy, E. F. Erickson, M. R. Haas, and J. R. Houck. **315**, 68, 40-F6 (1987)
- Detection of an Extremely Faint Emission Nebula Surrounding the Hot White Dwarf PG 0108 + 101. R. J. Reynolds. **315**, 234, 42-E3 (1987)
- The Leo Triplet Spiral Galaxy NGC 3628. I. VLA Observations of the Neutral Hydrogen Absorption. J. T. Schmelz, W. A. Baan, and A. D. Haschick. **315**, 492, 46-B3 (1987)
- Fine-Scale Motion in the Central Orion Nebula. Héctor O. Castañeda and C. R. O'Dell. **315**, L55, 45-E9 (1987)
- The Dispersal of Dense Protostellar Material: NH₃ Hot Cores and Outflows in Sagittarius B2. S. N. Vogel, R. Genzel, and Patrick Palmer. **316**, 243, 52-F3 (1987)
- The Continuum Spectra of Dust Complexes Associated with W3 Main, M42, W49A, and W51A. M. A. Gordon. **316**, 258, 52-G5 (1987)
- Infrared Line Observations of Low-Luminosity Outflow Sources. Howard A. Smith, J. Fischer, T. R. Geballe, and P. R. Schwartz. **316**, 265, 52-G12 (1987)
- High-Resolution Radio Observations of the Supernova Remnant G24.7 + 0.6 and the Discovery of an Ultracompact H II Region. R. H. Becker and D. J. Helfand. **316**, 660, 59-C10 (1987)

Nebulae: H II Regions—Continued

- The Composition Gradient across M81. *D. R. Garnett and G. A. Shields.* **317**, 82, 64-G7 (1987)
- A Near-Infrared Study of the NGC 6334-IV Region. *P. M. Harvey, A. R. Hyland, and S. M. Straw.* **317**, 173, 65-G8 (1987)
- Fine-Scale Motion in NGC 6514 and NGC 6523. *C. R. O'Dell, L. K. Townsley, and Hector O. Castañeda.* **317**, 676, 73-D10 (1987)
- Evidence for Turbulence in H II Regions. *C. R. O'Dell and Hector O. Castañeda.* **317**, 686, 73-E6 (1987)
- Sulfur, Carbon, Helium, and Hydrogen 125 α Observations and Physical Analysis of the W48 Neutral Interface. *J. P. Vallee.* **317**, 693, 73-E13 (1987)
- Study of the H42 α (86 GHz) Recombination Line in W3(OH). *Wm. J. Welch and J. Marr.* **317**, L21, 71-B10 (1987)
- Temperature and Density Structure of the Collapsing Core of G10.6 – 0.4. *Eric R. Keto, Paul T. P. Ho, and Aubrey D. Haschick.* **318**, 712, 88-F8 (1987)
- Giant H II Regions in M81. *Michele Kaufman, Frank N. Bash, R. C. Kennicutt, Jr., and P. W. Hodge.* **319**, 61, 93-F7 (1987)
- H II Region Abundances in Seyfert Galaxies. *I. N. Evans and M. A. Dopita.* **319**, 662, 102-B12 (1987)
- The Magnetic Field in Star-forming Large Globules. *Klaus-Werner Hodapp.* **319**, 842, 104-B13 (1987)
- Nitrogen Abundances in the Amorphous Galaxy NGC 5253. *Jeremy R. Walsh and Jean-René Roy.* **319**, L57, 107-C9 (1987)
- Far-Infrared Measurements of N/O in H II Regions: Evidence for Enhanced CN Process Nucleosynthesis in the Inner Galaxy. *D. F. Lester, H. L. Dinerstein, M. W. Werner, D. M. Watson, R. Genzel, and J. W. V. Storey.* **320**, 573, 116-A1 (1987)
- A New Ionization Model for Galaxies with Dominant Star-Formation Regions. *Rodger I. Thompson.* **321**, 153, 123-G11 (1987)
- Solar System-Sized Condensations in the Orion Nebula. *E. Churchwell, M. Felli, D. O. S. Wood, and M. Massi.* **321**, 516, 127-F11 (1987)
- Cosmological H II Regions and the Photoionization of the Intergalactic Medium. *Paul R. Shapiro and Mark L. Goux.* **321**, L107, 137-A13 (1987)
- Widespread Strong Methanol Masers near H II Regions. *R. P. Norris, J. L. Caswell, F. F. Gardner, and K. J. Wellington.* **321**, L159, 137-E8 (1987)
- Diffuse Einstein X-Ray Emission from the Region of RCW 49, a Bright Southern Emission Nebula. *A. Goldwurm, P. A. Caraveo, and G. F. Bignami.* **322**, 349, 141-E12 (1987)
- Measurements of the ^3He Abundance in the Interstellar Medium. *T. M. Bania, Robert T. Rood, and T. L. Wilson.* **323**, 30, 153-D3 (1987)
- A View of the Galactic H α Background: $208^\circ \leq l \leq 218^\circ$; $-2^\circ \leq b \leq +8^\circ$. *R. J. Reynolds.* **323**, 118, 154-D2 (1987)
- VLA Observations of H $_2$ CO in Absorption against the Cosmic Background Radiation: Clumps in the S140 Molecular Cloud. *Neal J. Evans II, Marc L. Kutner, and Lee G. Mundy.* **323**, 145, 154-F3 (1987)
- An Expanding System of Molecular Clouds Surrounding λ Orionis. *Ronald J. Maddalena and Mark Morris.* **323**, 179, 155-A10 (1987)
- Maps of Dust Clouds at 1.3 Millimeters Associated with Bright H II Regions. *M. A. Gordon and P. R. Jewell.* **323**, 766, 163-B5 (1987)
- Gravitational Collapse in Molecular Cloud Cores around Ultracompact H II Regions: Two Candidates. *Eric R. Keto, Paul T. P. Ho, and Mark J. Reid.* **323**, L117, 164-C1 (1987)
- A CO Survey of the Dark Nebulae in Perseus, Taurus, and Auriga. *H. Ungerechts and P. Thaddeus.* **323**, 645, 10-D6 (1987) (Abstr. in **313**, 930, 26-G13)
- The Case Low-Dispersion Northern Sky Survey. IV. Galaxies in the Bootes Void Region. *N. Sanduleak and Peter Pesch.* **323**, 809, 13-F6 (1987) (Abstr. in **314**, 831, 38-F7)
- Molecular Clouds and Cloud Cores in the Inner Galaxy. *N. Z. Scoville, Min Su Yun, D. P. Clemens, D. B. Sanders, and W. H. Waller.* **323**, 821, 13-G12 (1987) (Abstr. in **314**, 832, 38-F8)
- The Structure and Dynamics of Ringed Galaxies. III. Surface Photometry and Kinematics of the Ringed Nonbarred Spiral NGC 7531. *R. Buta.* **324**, 1, 17-A5 (1987) (Abstr. in **315**, 730, 48-E11)
- A Study of the Ground-State Hydroxyl Maser Emission Associated with 11 Regions of Star Formation. *Ralph A. Gaume and Robert L. Mutel.* **325**, 193, 31-A5 (1987) (Abstr. in **320**, 936, 120-B1)

Nebulae: Individual (arranged by Messier number, NGC number, and by Other Designations)

By Messier Number

- Submillimeter and Far-Infrared Spectroscopy of M17 and S106: UV-Heated, Quiescent Molecular Gas? *A. I. Harris, J. Stutzki, R. Genzel, J. B. Lugten, G. J. Stacey, and D. T. Jaffe.* **322**, L49, 145-D6 (1987)
- Dust Reradiation from M43. *J. Smith, D. A. Harper, and R. F. Loewenstein.* **314**, 76, 28-G7 (1987)
- [M57] The Ionization Structure of Planetary Nebulae. VII. New Ob-

servations of the Ring Nebula. *Timothy Barker.* **322**, 922, 150-A6 (1987)

By NGC Number

- Polarimetry of the NGC 2261/R Monoceros System and the Faint Jetlike Feature to its Southwest. *R. F. Warren-Smith, P. W. Draper, and S. M. Scarrott.* **315**, 500, 46-B11 (1987)
- The Planetary Nebula NGC 3918. *R. E. S. Clegg, J. P. Harrington, M. J. Barlow, and J. R. Walsh.* **314**, 551, 35-E7 (1987)
- A Near-Infrared Study of the NGC 6334-IV Region. *P. M. Harvey, A. R. Hyland, and S. M. Straw.* **317**, 173, 65-G8 (1987)
- Fine-Scale Motion in NGC 6514 and NGC 6523. *C. R. O'Dell, L. K. Townsley, and Hector O. Castañeda.* **317**, 676, 73-D10 (1987)
- Fine-Scale Motion in NGC 6514 and NGC 6523. *C. R. O'Dell, L. K. Townsley, and Hector O. Castañeda.* **317**, 676, 73-D10 (1987)
- [NGC 6720] The Ionization Structure of Planetary Nebulae. VII. New Observations of the Ring Nebula. *Timothy Barker.* **322**, 922, 150-A6 (1987)

By Other Designations: Names

- Airborne Spectrophotometry of Eta Carinae from 4.5 to 7.5 Microns and a Model for Source Morphology. *Ray W. Russell, David K. Lynch, John A. Hackwell, Richard J. Rudy, George S. Rossano, and M. W. Castelaz.* **321**, 937, 134-G1 (1987)
- Discovery of Fast-moving Nitrogen-rich Ejecta in the Supernova Remnant Cassiopeia A. *Robert A. Fesen, Robert H. Becker, and William P. Blair.* **313**, 378, 19-B3 (1987)
- Resolution of Compact Knots in Cassiopeia A. *Richard G. Arendt and John R. Dickel.* **315**, 567, 46-G8 (1987)
- Physical Processes and Infrared Emission from the Cassiopeia A Supernova Remnant. *E. Dwek, H. L. Dinerstein, F. C. Gillett, M. G. Hauser, and W. L. Rice.* **315**, 571, 47-A1 (1987)
- Observations of Infrared Emission from a Fast-moving Knot in Cassiopeia A. *Harriet L. Dinerstein, Daniel F. Lester, David M. Rank, Michael W. Werner, and Diane H. Wooden.* **312**, 314, 4-C11 (1987)
- Interaction of the High-Density Gas with the Bipolar Outflow in Cepheus A. *José M. Torrelles, Paul T. P. Ho, Luis F. Rodríguez, Jorge Cantó, and James M. Moran.* **321**, 884, 134-C4 (1987)
- [Cygnus Loop] A Sheet Description of the Emission from Middle-aged Supernova Remnants. *J. Jeff Hester.* **314**, 187, 30-A8 (1987)
- The Wolf-Rayet Population in 30 Doradus and Its Surroundings. *Anthony F. J. Moffat, Virpi S. Niemela, M. M. Phillips, You-hua Chu, and Wilhelm Seggewiss.* **312**, 612, 9-E7 (1987)
- On the Chemical Homogeneity of the 30 Doradus H II Region and a Local Enrichment by Wolf-Rayet Stars. *Michael Rosa and John S. Mathis.* **317**, 163, 65-F11 (1987)
- [Lynds 1457] A Hard X-Ray Source in the Nearest Molecular Cloud. *J. P. Halpern and J. Patterson.* **312**, L31, 7-C2 (1987)
- [ρ Ophiuchi] L1689N: Misalignment between a Bipolar Outflow and a Magnetic Field. *Alwyn Wootten and R. B. Loren.* **317**, 220, 66-D1 (1987)
- Forbidden Coronal Iron Line Images of Puppis A: Cloud Evaporation or Shocked Cloud? *Richard G. Teske and Robert Petre.* **314**, 673, 37-A2 (1987)
- Forbidden Coronal Iron-Line Emission in the Puppis A Shock Front: The Effect of Inhomogeneities. *Richard G. Teske and Robert Petre.* **318**, 370, 83-A1 (1987)
- The Dispersal of Dense Protostellar Material: NH $_3$ Hot Cores and Outflows in Sagittarius B2. *S. N. Vogel, R. Genzel, and Patrick Palmer.* **316**, 243, 52-F3 (1987)
- By Other Designations: Alphanumeric
- The Unusual Dust-scattering Properties in the Reflection Nebula CED 201. *A. N. Witt, R. C. Bohlin, T. P. Stecher, and S. M. Graff.* **321**, 912, 134-E4 (1987)
- High-Resolution Observations of CO from the Bipolar Nebula CRL 2688. *R. Kawabe, M. Ishiguro, T. Kasuga, K.-I. Morita, N. Ukita, H. Kobayashi, S. Okumura, E. Fomalont, and N. Kaiju.* **314**, 322, 31-F1 (1987)
- Pulsar-like Emission from the Supernova Remnant CTB 80. *Richard G. Strom.* **319**, L103, 107-F13 (1987)
- G0.9 + 0.1 and the Emerging Class of Composite Supernova Remnants. *D. J. Helfand and R. H. Becker.* **314**, 203, 30-C10 (1987)
- [G166.0 + 4.3] VRO 42.05.01: A Supernova Remnant Reenergizing an Interstellar Cavity. *S. Pineault, T. L. Landecker, and D. Roudledge.* **315**, 580, 47-A10 (1987)
- High-Resolution Radio Observations of the Supernova Remnant G24.7 + 0.6 and the Discovery of an Ultracompact H II Region. *R. H. Becker and D. J. Helfand.* **316**, 660, 59-C10 (1987)
- Einstein IPC Imaging and Spectral Observations of the Supernova Remnant HB 9. *D. A. Leahy.* **322**, 917, 150-A1 (1987)
- A Possible Protostar near HH 7–11. *E. N. Grossman, C. R. Masson, A. I. Sargent, N. Z. Scoville, S. Scott, and D. P. Woody.* **320**, 356, 112-A1 (1987)

- Infrared Spectroscopy of the Supernova Remnant IC 443. *James R. Graham, Gillian S. Wright, and Andrew J. Longmore.* **313**, 847, 26-A7 (1987)
- [IC 443] A Sheet Description of the Emission from Middle-aged Supernova Remnants. *J. Jeff Hester.* **314**, 187, 30-A8 (1987)
- IRAS 1809 – 3211: Optically Known as "Gomez's Hamburger". *Maria Teresa Ruiz, Victor Blanco, José Maza, Steve Heathcote, Andrew Phillips, Kimiaki Kawara, Claudio Anguita, Mario Hamuy, and Arturo Gómez.* **316**, L21, 56-B10 (1987)
- IRAS 18059 – 3211: Optically Known As Gomez's Hamburger: Erratum. *M. T. Ruiz, V. Blanco, J. Maza, S. Heathcote, A. Phillips, K. Kawara, C. Anguita, M. Hamuy, and A. Gomez.* **320**, L157, 121-F14 (1987) (Orig. paper in **316**, L21, 56-B10)
- High-Resolution Images of the L1551 Bipolar Outflow: Evidence for an Expanding, Accelerated Shell. *G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, F. P. Schloerb, K. M. Strom, and G. L. Grasdale.* **319**, 742, 103-B6 (1987)
- The 2 Micron Spectrum of L1551 IRS 5. *John S. Carr, P. M. Harvey, and D. F. Lester.* **321**, L71, 129-G7 (1987)
- The Rich Molecular Spectrum and the Rapid Outflow of OH 231.8 + 4.2. *Mark Morris, Stéphane Guilloteau, Robert Lucas, and Alain Omont.* **321**, 888, 134-C8 (1987)
- Diffuse Einstein X-Ray Emission from the Region of RCW 49, a Bright Southern Emission Nebula. *A. Goldwurm, P. A. Caraveo, and G. F. Bignami.* **322**, 349, 141-E12 (1987)
- An Active Star Formation Site in RCW 108. *Steven Straw, A. R. Hyland, Terry J. Jones, Paul M. Harvey, Bruce A. Wilking, and Marshall Joy.* **314**, 283, 31-B12 (1987)
- Submillimeter and Far-Infrared Spectroscopy of M17 and S106: UV-Heated, Quiescent Molecular Gas? *A. I. Harris, J. Stutzki, R. Genzel, J. B. Lugten, G. J. Stacey, and D. T. Jaffe.* **322**, L49, 145-D6 (1987)
- The Bright-Rimmed Molecular Cloud around S140 IRS. II. Bipolar Outflow from S140 IRS 1. *M. Hayashi, T. Hasegawa, T. Omodaka, S. S. Hayashi, and R. Miyawaki.* **312**, 327, 4-D10 (1987)
- VLA Observations of H₂CO in Absorption against the Cosmic Background Radiation: Clumps in the S140 Molecular Cloud. *Neal J. Evans II, Marc L. Kutner, and Lee G. Mundy.* **323**, 145, 154-F3 (1987)
- The Circumstellar Envelope of W3(OH): NH₃ Observations. *Mark J. Reid, Philip C. Myers, and John H. Bieging.* **312**, 830, 12-A9 (1987)
- Sulfur, Carbon, Helium, and Hydrogen 125 α Observations and Physical Analysis of the W48 Neutral Interface. *J. P. Vallee.* **317**, 693, 73-E13 (1987)
- 1300 Micron Continuum and C¹⁸O Line Mapping of the Giant Molecular Cloud Cores in Orion, W49, and W51. *F. Peter Schloerb, Ronald L. Snell, and P. R. Schwartz.* **319**, 426, 97-G5 (1987)
- 1300 Micron Continuum and C¹⁸O Line Mapping of the Giant Molecular Cloud Cores in Orion, W49, and W51. *F. Peter Schloerb, Ronald L. Snell, and P. R. Schwartz.* **319**, 426, 97-G5 (1987)
- [3C 358] On the Origin of Kepler's Supernova Remnant. *Rino Bandiera.* **319**, 885, 104-F1 (1987)
- Nebulae: Internal Motions**
- Temporal Changes of the IRS 5 Jet in L1551. *Th. Neckel and H. J. Staudte.* **322**, L27, 145-B13 (1987)
- Spheromak Model of Planetary Nebulae. *Charles L. Bennett.* **323**, L123, 164-C7 (1987)
- Nebulae: Orion Nebula**
- Ion-Molecule Calculation of the Abundance Ratio of CCD to CCH in Dense Interstellar Clouds. *Eric Herbst, Nigel G. Adams, David Smith, and D. J. DeFrees.* **312**, 351, 4-F7 (1987)
- Filamentary Structure in the Orion Molecular Cloud. *John Bally, William D. Langer, Antony A. Stars, and Robert W. Wilson.* **312**, L45, 14-B12 (1987)
- Compact Continuum Radio Sources in the Orion Nebula. *Guido Garay, James M. Moran, and Mark J. Reid.* **314**, 535, 35-D2 (1987)
- Aperture Synthesis Maps of HDO Emission in Orion-KL. *R. L. Plambeck and M. C. H. Wright.* **317**, L101, 78-E4 (1987)
- Solar System-Sized Condensations in the Orion Nebula. *E. Churchwell, M. Felli, D. O. S. Wood, and M. Massi.* **321**, 516, 127-F11 (1987)
- Interpretation of Rotationally Excited Far-Infrared OH Emission in Orion-KL. *G. J. Melnick, R. Genzel, and J. B. Lugten.* **321**, 530, 127-G10 (1987)
- H₂O Line Emission from Shocked Gas. *David A. Neufeld and Gary J. Melnick.* **322**, 266, 140-F12 (1987)
- Radio Recombination Lines from Fast Shocks in Molecular Clouds, with Application to Bipolar Flows. *Christopher F. McKee and David J. Hollenbach.* **322**, 275, 140-G7 (1987)
- Nebulae: Planetary**
- Ground-based Observations of IRAS Candidates for Late Asymptotic Giant Branch Stars. *Sun Kwok, Bruce J. Hrivnak, and R. T. Boreiko.* **312**, 303, 4-B14 (1987)
- Mass Distribution and Evolutionary Scheme for Central Stars of Planetary Nebulae. *Sara R. Heap and Harry J. Augensen.* **313**, 268, 17-G10 (1987)
- The Planetary Nebula NGC 3918. *R. E. S. Clegg, J. P. Harrington, M. J. Barlow, and J. R. Walsh.* **314**, 551, 35-E7 (1987)
- Atomic Hydrogen in Planetary Nebulae. *Stephen E. Schneider, Peter R. Silvergate, Daniel R. Altschuler, and Carlo Giovanardi.* **314**, 572, 35-G1 (1987)
- Detection of an Extremely Faint Emission Nebula Surrounding the Hot White Dwarf PG 0108 + 101. *R. J. Reynolds.* **315**, 234, 42-E3 (1987)
- New Evolutionary Relationships for Magellanic Cloud Planetary Nebulae. *Michael A. Dopita, Stephen J. Meatheringham, Peter R. Wood, B. Louise Webster, David H. Morgan, and Holland C. Ford.* **315**, L107, 49-D2 (1987)
- Dynamics of the Outer Disk and Halo of M31. *Richard Nolthenius and Holland C. Ford.* **317**, 62, 64-E13 (1987)
- Temperature and Emission-Measure Distributions for Several Planetary Nebulae. *J. P. Basart and C. T. Daub.* **317**, 412, 68-D14 (1987)
- Emission-Line Ratios for O III in Gaseous Nebulae and a Comparison between Theory and Observation. *F. P. Kennan and K. M. Aggarwal.* **319**, 403, 97-E7 (1987)
- The (C III λ 1909/Si III λ 1892) Ratio as a Diagnostic for Planetary Nebulae and Symbiotic Stars. *Walter A. Feibelman and Lawrence H. Aller.* **319**, 407, 97-E11 (1987)
- Physical Parameters for 12 Planetary Nebulae and Their Central Stars in the Magellanic Clouds. *Lawrence H. Aller, Charles D. Keyes, Stephen P. Maran, Theodore R. Gull, Andrew G. Michalitsianos, and Theodore P. Stecher.* **320**, 159, 109-F12 (1987)
- Angular Diameters and Fluxes of Magellanic Cloud Planetary Nebulae. II. High-Speed Direct Imaging. *P. R. Wood, S. J. Meatheringham, M. A. Dopita, and D. H. Morgan.* **320**, 178, 110-A11 (1987)
- Optical Spectroscopy of IRAS Sources with Infrared Emission Bands: IRAS 21282 + 5050 and the Diffuse Interstellar Bands. *Martin Cohen and B. F. Jones.* **321**, L151, 137-E1 (1987)
- Fluorescent Excitation of Interstellar H₂. *John H. Black and Ewine F. van Dishoeck.* **322**, 412, 142-C11 (1987)
- The Ionization Structure of Planetary Nebulae. VII. New Observations of the Ring Nebula. *Timothy Barker.* **322**, 922, 150-A6 (1987)
- A Search for Pulsating Stars Similar to PG 1159 – 035 and K1-16. *Albert D. Grauer, Howard E. Bond, James Liebert, Thomas A. Fleming, and Richard F. Green.* **323**, 271, 156-A10 (1987)
- Spheromak Model of Planetary Nebulae. *Charles L. Bennett.* **323**, L123, 164-C7 (1987)
- A Very Deep IRAS Survey at $l = 97^\circ$, $b = 30^\circ$. *Perry Hacking and J. R. Houck.* **63**, 311, 5-A3 (1987) (Abstr. in **312**, 965, 13-E6)
- Multiple-Shell Planetary Nebulae. I. Morphologies and Frequency of Occurrence. *You-Hua Chu, George H. Jacoby, and Richard Arendt.* **64**, 529, 24-C1 (1987) (Abstr. in **317**, 1002, 77-B5)
- A Spectroscopic Survey of 51 Planetary Nebulae. *L. H. Aller and C. D. Keyes.* **65**, 405, 34-A1 (1987) (Abstr. in **321**, 1051, 136-A2)
- Nebulae: Reflection**
- IRAS Surface Brightness Maps of Reflection Nebulae in the Pleiades. *Michael W. Castelaz, K. Sellgren, and M. W. Werner.* **313**, 853, 26-B1 (1987)
- The Discovery of an Infrared Reflection Nebula Surrounding R Coronae Australis IRS 5. *Michael W. Castelaz and John A. Hackwell.* **314**, 317, 31-E9 (1987)
- High-Resolution Observations of CO from the Bipolar Nebula CRL 2688. *R. Kawahe, M. Ishiguro, T. Kasuga, K.-I. Morita, N. Ukita, H. Kobayashi, S. Okumura, E. Fomalont, and N. Kaifu.* **314**, 322, 31-F1 (1987)
- IRAS 1809 – 3211: Optically Known as "Gomez's Hamburger". *Maria Teresa Ruiz, Victor Blanco, José Maza, Steve Heathcote, Andrew Phillips, Kimiaki Kawara, Claudio Anguita, Mario Hamuy, and Arturo Gómez.* **316**, L21, 56-B10 (1987)
- FY Aquilae and the Gamma-Ray Burst Event of 1979 March 31. *Dieter Hartmann and Richard W. Pogge.* **318**, 363, 82-G4 (1987)
- Fluorescent Molecular Hydrogen Emission from the Reflection Nebula NGC 2023. *Ian Gatley, Tetsuo Hasegawa, Hiroko Suzuki, Ron Garden, Peter Brand, John Lightfoot, William Glencross, Haruyuki Okuda, and Tetsuya Nagata.* **318**, L73, 92-D4 (1987)
- Level Population and Para/Ortho Ratio of Fluorescent H₂ in NGC 2023. *Tetsuo Hasegawa, Ian Gatley, Ron P. Garden, Peter W. J. L. Brand, Masatoshi Ohishi, Masahiko Hayashi, and Norio Kaifu.* **318**, L77, 92-D12 (1987)
- Para/Ortho Abundance Ratio of Molecular Hydrogen in NGC 2023. *K. Takayanagi, K. Sakimoto, and K. Onda.* **318**, L81, 92-E2 (1987)
- CCD Observations of Diffuse Interstellar Bands in Reflection Nebulae. *Karl Josaftsson and Theodore P. Snow.* **319**, 436, 98-A1 (1987)
- Molecular and Atomic Clouds Associated with Infrared Cirrus in Ursa

Nebulae: Reflection—Continued

- Major. Hendrik Willem de Vries, Andreas Heithausen, and Patrick Thaddeus. **319**, 723, 103-A1 (1987)
- A New Cometary Nebula in Cygnus. Th. Neckel and H. J. Staude. **320**, L145, 121-F1 (1987)
- IRAS 18059 – 3211: Optically Known As Gomez's Hamburger: Erratum. M. T. Ruiz, V. Blanco, J. Maza, S. Heathcote, A. Phillips, K. Kawara, C. Anguita, M. Hamuy, and A. Gomez. **320**, L157, 121-F14 (1987) (Orig. paper in **316**, L21, 56-B10)
- The Unusual Dust-scattering Properties in the Reflection Nebula CED 201. A. N. Witt, R. C. Bohlin, T. P. Stecher, and S. M. Graff. **321**, 912, 134-E4 (1987)
- Fluorescent Excitation of Interstellar H₂. John H. Black and Ewine F. van Dishoeck. **322**, 412, 142-C11 (1987)
- Nebulae: Supernova Remnants**
- Observations of Infrared Emission from a Fast-moving Knot in Cassiopeia A. Harriet L. Dinerstein, Daniel F. Lester, David M. Rank, Michael W. Werner, and Diane H. Wooden. **312**, 314, 4-C11 (1987)
- A 9 Month Long Soft X-Ray Survey of the Large Magellanic Cloud. I. X-Ray Map at $\frac{1}{2}$ keV. K. P. Singh, J. A. Nousek, D. N. Burrows, and G. P. Garmire. **313**, 185, 17-A7 (1987)
- Discovery of Fast-moving Nitrogen-rich Ejecta in the Supernova Remnant Cassiopeia A. Robert A. Fesen, Robert H. Becker, and William P. Blair. **313**, 378, 19-B3 (1987)
- Large Negative ⁵⁰Ti Anomalies in Refractory Inclusions from the Murchison Carbonaceous Chondrite: Evidence for Incomplete Mixing of Neutron-rich Supernova Ejecta into the Solar System. Richard W. Hinton, Andrew M. Davis, and Debra E. Scatena-Wachel. **313**, 420, 19-E12 (1987)
- Infrared Spectroscopy of the Supernova Remnant IC 443. James R. Graham, Gillian S. Wright, and Andrew J. Longmore. **313**, 847, 26-A7 (1987)
- X-Ray Studies of the Supernova Remnant N132D. I. Morphology. John P. Hughes. **314**, 103, 29-B6 (1987)
- A Sheet Description of the Emission from Middle-aged Supernova Remnants. J. Jeff Hester. **314**, 187, 30-A8 (1987)
- G0.9 + 0.1 and the Emerging Class of Composite Supernova Remnants. D. J. Helfand and R. H. Becker. **314**, 203, 30-C10 (1987)
- Forbidden Coronal Iron Line Images of Puppis A: Cloud Evaporation or Shocked Cloud? Richard G. Teske and Robert Petre. **314**, 673, 37-A2 (1987)
- Supernovae versus Models of the Interstellar Medium and the Gaseous Halo. Carl Heiles. **315**, 555, 46-F10 (1987)
- Resolution of Compact Knots in Cassiopeia A. Richard G. Arendt and John R. Dickel. **315**, 567, 46-G8 (1987)
- Physical Processes and Infrared Emission from the Cassiopeia A Supernova Remnant. E. Dwek, H. L. Dinerstein, F. C. Gillett, M. G. Hauser, and W. L. Rice. **315**, 571, 47-A1 (1987)
- VRO 42.05.01: A Supernova Remnant Reenergizing an Interstellar Cavity. S. Pineault, T. L. Landecker, and D. Routledge. **315**, 580, 47-A10 (1987)
- High-Velocity Emission in Young Supernova Remnants: SN 1006 and SN 1572. Robert P. Kirshner, P. Frank Winkler, and Roger A. Chevalier. **315**, L135, 49-F3 (1987)
- High-Resolution Radio Observations of the Supernova Remnant G24.7 + 0.6 and the Discovery of an Ultracompact H II Region. R. H. Becker and D. J. Helfand. **316**, 660, 59-C10 (1987)
- Deep Einstein X-Ray Imagery of the Small Magellanic Cloud. Frederick C. Bruhweiler, Daniel A. Klingensmith III, Theodore R. Gull, and Sabatino Sofia. **317**, 152, 65-E11 (1987)
- Shock-Front Compression of the Magnetic Field in the Canis Major R1 Star Formation Region. F. J. Vrba, R. Baierlein, and W. Herbst. **317**, 207, 66-C4 (1987)
- Forbidden Coronal Iron-Line Emission in the Puppis A Shock Front: The Effect of Inhomogeneities. Richard G. Teske and Robert Petre. **318**, 370, 83-A1 (1987)
- The Structure of Time-dependent Interstellar Shocks and Grain Destruction in the Interstellar Medium. Christopher F. McKee, David J. Hollenbach, C. Gregory Seab, and A. G. G. M. Tielens. **318**, 674, 88-C7 (1987)
- IRAS Observations of Collisionally Heated Dust in Large Magellanic Cloud Supernova Remnants. James R. Graham, A. Evans, J. S. Albinson, M. F. Bode, and W. P. S. Meikle. **319**, 126, 94-D5 (1987)
- A Scanning Modulation Collimator Observation of the High Energy X-Ray Source in the Crab Nebula. R. M. Pelling, W. S. Paciesas, L. E. Peterson, K. Makishima, M. Oda, Y. Ogawara, and S. Miyamoto. **319**, 416, 97-F7 (1987)
- On the Origin of Kepler's Supernova Remnant. Rino Bandiera. **319**, 885, 104-F1 (1987)
- Pulsar-like Emission from the Supernova Remnant CTB 80. Richard G. Strom. **319**, L103, 107-F13 (1987)

- IRAS Observations of Supernova Remnants: A Comparison between Their Infrared and X-Ray Cooling Rates. Eli Dwek, Robert Petre, Andrew Szymkowiak, and Walter L. Rice. **320**, 27, 114-C4 (1987)
- Structural Details of the Sagittarius A Complex: Evidence for a Large-Scale Poloidal Magnetic Field in the Galactic Center Region. F. Yusef-Zadeh and M. Morris. **320**, 545, 115-D12 (1987)
- X-Ray Observations of the Supernova Remnant N103B in the Large Magellanic Cloud. K. P. Singh, N. J. Westergaard, H. W. Schnopper, and D. J. Helfand. **322**, 80, 138-G3 (1987)
- Predicted [Ni II] Infrared Line Strengths in the Crab Nebula and IC 443. Richard B. C. Henry. **322**, 399, 142-B12 (1987)
- A Radio Search for Crab-like Nebulae in M33. Stephen P. Reynolds and John D. Fix. **322**, 673, 147-B7 (1987)
- The Infrared Diagnostic of a Dusty Plasma with Applications to Supernova Remnants. Eli Dwek. **322**, 812, 148-F6 (1987)
- VLA and Low-Frequency VLBI Observations of the Radio Source 0503 + 467: Austere Constraints on Interstellar Scattering in Two Media. Steven R. Spangler, Alan L. Fey, and James M. Cordes. **322**, 909, 149-G3 (1987)
- Einstein IPC Imaging and Spectral Observations of the Supernova Remnant HB 9. D. A. Leahy. **322**, 917, 150-A1 (1987)
- Neutrinos**
- Hypercharge, Solar Structure, and Stellar Evolution. Ronald L. Gilliland and Werner Däppen. **313**, 429, 19-F7 (1987)
- Neutrino Emission by the Pair, Plasma, and Photo Processes in the Weinberg-Salam Model. Paul J. Schinder, David N. Schramm, Paul J. Wiita, Steven H. Margolis, and David L. Tubbs. **313**, 531, 22-E9 (1987)
- Neutrino Annihilation in Type II Supernovae. Jeremy Goodman, Arnon Dar, and Shmuel Nussinov. **314**, L7, 33-B9 (1987)
- An Upper Limit on the Flux of Extraterrestrial Neutrinos. R. Svoboda, R. M. Bionta, G. Blewitt, C. B. Bratton, D. Casper, P. Chrysicopolou, A. Ciocio, R. Claus, B. Cortez, S. T. Dye, S. Errede, G. W. Foster, W. Gajewski, K. S. Ganezer, M. Goldhaber, T. J. Haines, T. W. Jones, D. Kielczewska, W. R. Kropp, J. G. Learned, J. M. LoSecco, J. Matthews, H. S. Park, R. Reines, J. Schultz, S. Seidel, E. Shumard, D. Sinclair, H. W. Sobel, J. L. Stone, L. Sulak, G. Thornton, J. C. van der Velde, and C. Wuest. **315**, 420, 45-C10 (1987)
- Dynamical Scenarios with Unstable Neutrinos. T. Padmanabhan and M. M. Vasanthi. **315**, 411, 45-C1 (1987)
- Neutrino Flows in Collapsing Stars: A Two-Fluid Model: Erratum. J. Cooperstein, L. J. van den Horn, and E. A. Baron. **315**, 729, 48-E10 (1987) (Orig. paper in **309**, 653, 128-D5)
- Neutrino Emission Processes in Hyperon-populated Neutron Stars. Oren V. Maxwell. **316**, 691, 59-E14 (1987)
- Neutrino-Pair Bremsstrahlung in Dense Stars. V. Partially Degenerate Electrons. Hiroharu Munakata, Yasuharu Kohyama, and Naoki Itoh. **316**, 708, 59-G3 (1987)
- Collective Effects on Thomson Scattering in the Solar Interior. David B. Boercker. **316**, L95, 62-D12 (1987)
- Dark Matter in the Universe: Massive Neutrinos Revisited. R. Cowik and P. Ghosh. **317**, 26, 64-C4 (1987)
- Neutrinos from Gravitational Collapse. Ron Mayle, James R. Wilson, and David N. Schramm. **318**, 288, 82-A11 (1987)
- Feasibility of Cosmic Neutrino Detectors Based on Coherent Interaction with Superconductors. P. F. Smith and J. D. Lewin. **318**, 738, 89-A10 (1987)
- Convection and the Mechanism of Type II Supernovae. Adam Burrows. **318**, L57, 92-C3 (1987)
- Neutrinos from SN 1987A. Adam Burrows and James M. Lattimer. **318**, L63, 92-C8 (1987)
- Late-Time Neutrino Heating and Energetics of Stalled Shocks in Type II Supernovae. A. Ray and K. Kar. **319**, 143, 94-E9 (1987)
- Radiative Alpha-Capture Rates Leading to A = 7 Nuclei: Applications to the Solar Neutrino Problem and Big Bang Nucleosynthesis. Toshitaka Kajino, Hiroshi Toki, and Sam M. Austin. **319**, 531, 99-A12 (1987)
- Is Solar Neutrino Capture Rate Correlated with Sunspot Number? J. N. Bahcall, G. B. Field, and W. H. Press. **320**, L69, 114-F1 (1987)
- Weakly Interacting Massive Particle Distribution in and Evaporation from the Sun. Andrew Gould. **321**, 560, 128-C3 (1987)
- Resonant Enhancements in Weakly Interacting Massive Particle Capture by the Earth. Andrew Gould. **321**, 571, 128-D1 (1987)
- Neutrino Pair Energy Deposition in Supernovae. J. Cooperstein, L. J. van den Horn, and E. Baron. **321**, L129, 137-C7 (1987)
- Convection in Supernova Theory. H. A. Bethe, G. E. Brown, and J. Cooperstein. **322**, 201, 140-B3 (1987)
- Neutrino-Pair Bremsstrahlung in Dense Stars. IV. Phonon Contributions in the Crystalline Lattice Phase: Erratum. Naoki Itoh, Yasuharu Kohyama, Noriyoshi Matsumoto, and Midori Seki. **322**, 584, 144-C9 (1987) (Orig. paper in **285**, 304, 113-C2)

- Resonant Neutrino Oscillations and Stellar Collapse. *G. M. Fuller, R. W. Mayle, J. R. Wilson, and D. N. Schramm.* **322**, 795, 148-E3 (1987)
- The Initial Neutrino Events from Supernovae as Evidence for Matter versus Antimatter. *Alan V. Barnes, Thomas J. Weiler, and Sandip Pakvasa.* **323**, L31, 158-C4 (1987)
- Notices**
- Editorial: Publication Times and Volume Indexes. *Helmut A. Abt and A. Dalgarno.* **315**, L71, 49-A9 (1987)
- Editorial: Subscription Rate Increases. *Helmut A. Abt.* **321**, 1, 122-A7 (1987)
- Announcement: Availability of a Current Index to the *Astrophysical Journal* and the *Astronomical Journal*. *Helmut A. Abt.* **322**, 1073, 151-C11 (1987)
- Nuclear Reactions**
- Light-Element Yields with Cosmological Decaying Gravitinos. *R. Dominguez-Tenreiro.* **313**, 523, 22-E1 (1987)
- Maxwellian-averaged Neutron Capture Cross Sections for ^{99}Tc and $^{95-98}\text{Mo}$. *R. R. Winters and R. L. Macklin.* **313**, 808, 25-E10 (1987)
- Neutron Capture Nucleosynthesis during Core Helium Burning in Massive Stars. *N. Prantzos, M. Arnould, and J.-P. Arcoragi.* **315**, 209, 42-C6 (1987)
- Alpha-Burning of ^{14}O . *Michael Wiescher, Volker Harms, Joachim Görres, Friedrich-Karl Thielemann, and Lawrence J. Rybarczyk.* **316**, 162, 51-F10 (1987)
- Neutrino Emission Processes in Hyperon-populated Neutron Stars. *Oren V. Maxwell.* **316**, 691, 59-E14 (1987)
- Positrons from Accelerated Particle Interactions. *B. Kozlovsky, R. E. Lingenfelter, and R. Ramaty.* **316**, 801, 60-G6 (1987)
- On the Origin of the Pion-Decay Radiation in the 1982 June 3 Solar Flare. *R. Ramaty, R. J. Murphy, and C. D. Dermer.* **316**, L41, 56-D3 (1987)
- S-Matrix Calculation of the Triple-Alpha Reaction. *Ikko Fushiki and D. Q. Lamb.* **317**, 368, 68-A1 (1987)
- Elemental Technetium and Promethium as Cosmic-Ray Clocks. *J. Drach and M. H. Salamon.* **319**, 237, 95-E9 (1987)
- Radiative Alpha-Capture Rates Leading to $A = 7$ Nuclei: Applications to the Solar Neutrino Problem and Big Bang Nucleosynthesis. *Toshitaka Kajino, Hiroshi Toki, and Sam M. Austin.* **319**, 531, 99-A12 (1987)
- A Determination of the $^3\text{He}/\text{H}$ Ratio in the Solar Photosphere from Flare Gamma-Ray Line Observations. *X.-M. Hua and R. E. Lingenfelter.* **319**, 555, 99-C14 (1987)
- EXOSAT Observations of 4U/MXB 1636 - 53: On the Relation between the Amount of Accreted Fuel and the Strength of an X-Ray Burst. *W. H. G. Lewin, W. Penninx, J. van Paradijs, E. Damen, M. Sztajno, J. Trümper, and M. van der Klis.* **319**, 893, 104-F9 (1987)
- On the Theory of Type I X-Ray Bursts. The Energetics of Bursts and the Nuclear Fuel Reservoir in the Envelope. *Masayuki Y. Fujimoto, Mirek Sztajno, Walter H. G. Lewin, and Jan van Paradijs.* **319**, 902, 104-G5 (1987)
- Radiative Transitions in ^{27}Al and Their Relevance to the $^{26}\text{Al}(p,\gamma)^{27}\text{Si}$ Reaction under Stellar Conditions. *C. Rangacharyulu, G. Kuechler, A. Richter, and E. Spamer.* **320**, 405, 112-D9 (1987)
- Electron Injection by Relativistic Protons in Active Galactic Nuclei. *Marek Sikora, John G. Kirk, Mitchell C. Begelman, and Peter Schneider.* **320**, L81, 121-B1 (1987)
- Axion Bremsstrahlung in Dense Stars. *Masayuki Nakagawa, Yasuharu Kohyama, and Naoki Itoh.* **322**, 291, 141-A9 (1987)
- The Initial Neutrino Events from Supernovae as Evidence for Matter versus Antimatter. *Alan V. Barnes, Thomas J. Weiler, and Sandip Pakvasa.* **323**, L31, 158-C4 (1987)
- New Insights from a Global View of X-Ray Bursts. *Ikko Fushiki and D. Q. Lamb.* **323**, L55, 158-D10 (1987)
- High-Energy Processes in Solar Flares. *R. J. Murphy, C. D. Dermer, and R. Ramaty.* **63**, 721, 11-D13 (1987) (Abstr. in **313**, 931, 26-G14)
- Nucleosynthesis**
- Nitrogen and Sulfur Overabundances in the Population II Supergiant HD 46703. *Howard E. Bond and R. Earle Luck.* **312**, 203, 3-B10 (1987)
- Nucleosynthesis inside Thick Accretion Disks around a Black Hole. I. Thermodynamic Conditions and Preliminary Analysis. *Sandip K. Chakrabarti, Liping Jin, and W. David Arnett.* **313**, 674, 24-B10 (1987)
- Maxwellian-averaged Neutron Capture Cross Sections for ^{99}Tc and $^{95-98}\text{Mo}$. *R. R. Winters and R. L. Macklin.* **313**, 808, 25-E10 (1987)
- Chemical Evolution, Stellar Nucleosynthesis, and A Variable Star Formation Rate. *Keith A. Olive, Friedrich-Karl Thielemann, and James W. Truran.* **313**, 813, 25-F1 (1987)
- The Nature of the Recurrent Novae. *Ronald F. Webbink, Mario Livio, James W. Truran, and Marina Orlo.* **314**, 653, 36-F9 (1987)
- Neutron Capture Nucleosynthesis during Core Helium Burning in Massive Stars. *N. Prantzos, M. Arnould, and J.-P. Arcoragi.* **315**, 209, 42-C6 (1987)
- Off-Center Ignition of Nuclear Burning in Merging White Dwarfs. *Yasushi Kawai, Hideyuki Saio, and Ken'ichi Nomoto.* **315**, 229, 42-D12 (1987)
- Galactic Chemical Evolution: z versus $\lambda n(1/\mu)$ Relationship. *Donald D. Clayton.* **315**, 451, 45-F1 (1987)
- A Reanalysis of Galactic Primary Nucleosynthesis. *Bruce A. Twarog and J. Craig Wheeler.* **316**, 153, 51-F1 (1987)
- Alpha-Burning of ^{14}O . *Michael Wiescher, Volker Harms, Joachim Görres, Friedrich-Karl Thielemann, and Lawrence J. Rybarczyk.* **316**, 162, 51-F10 (1987)
- S-Matrix Calculation of the Triple-Alpha Reaction. *Ikko Fushiki and D. Q. Lamb.* **317**, 368, 68-A1 (1987)
- Gamma-Ray Constraints on ^{22}Na Yields in Nova Explosions. *J. C. Higdon and William A. Fowler.* **317**, 710, 73-G2 (1987)
- On Interacting Helium Star-White Dwarf Pairs as Supernova Precursors. *Ikko Iben, Jr., Ken'ichi Nomoto, Amedeo Tornambè, and Alexander V. Tutukov.* **317**, 717, 73-G11 (1987)
- The Core Helium Flash and Surface Abundance Anomalies. *Robert G. Deupree and Richard K. Wallace.* **317**, 724, 74-A4 (1987)
- The Lithium Abundance in Halo Stars. *L. M. Hobbs and Douglas K. Duncan.* **317**, 796, 74-F10 (1987)
- Antimatter and Light Element Yields: Could Dark Matter be Baryonic? *R. Dominguez-Tenreiro and G. Yepes.* **317**, L1, 71-A4 (1987)
- On the Collapse of 8-10 M_{\odot} Stars Due to Electron Capture. *Shigeki Miyaji and Ken'ichi Nomoto.* **318**, 307, 82-C2 (1987)
- A Search for $^{14}\text{C}^{16}\text{O}$ in the Atmospheres of Evolved Stars. *Michael J. Harris and David L. Lambert.* **318**, 868, 90-D12 (1987)
- Calculated Gamma-Ray Line Fluxes from the Type II Supernova 1987A. *K. W. Chan and R. E. Lingenfelter.* **318**, L51, 92-B12 (1987)
- Elemental Technetium and Promethium as Cosmic-Ray Clocks. *J. Drach and M. H. Salamon.* **319**, 237, 95-E9 (1987)
- Radiative Alpha-Capture Rates Leading to $A = 7$ Nuclei: Applications to the Solar Neutrino Problem and Big Bang Nucleosynthesis. *Toshitaka Kajino, Hiroshi Toki, and Sam M. Austin.* **319**, 531, 99-A12 (1987)
- Radiative Transitions in ^{27}Al and Their Relevance to the $^{26}\text{Al}(p,\gamma)^{27}\text{Si}$ Reaction under Stellar Conditions. *C. Rangacharyulu, G. Kuechler, A. Richter, and E. Spamer.* **320**, 405, 112-D9 (1987)
- The Quark-Hadron Phase Transition and Primordial Nucleosynthesis. *C. A. Alcock, G. M. Fuller, and G. J. Mathews.* **320**, 439, 114-C1 (1987)
- Far-Infrared Measurements of N/O in H II Regions: Evidence for Enhanced CN Process Nucleosynthesis in the Inner Galaxy. *D. F. Lester, H. L. Dinerstein, M. W. Werner, D. M. Watson, R. Genzel, and J. W. V. Storey.* **320**, 573, 116-A1 (1987)
- Neutron-Exposure Variations in MS and S Stars, and the Implications for s-Process Nucleosynthesis. *Verne V. Smith, David L. Lambert, and Andrew McWilliam.* **320**, 862, 119-C3 (1987)
- On the Origin of the Solar System s-Process Abundances. *Robert A. Malaney and Arnold I. Boothroyd.* **320**, 866, 119-C7 (1987)
- Nuclear Runaways in a C/O White Dwarf Accreting H-rich Material Possessing Angular Momentum. *Warren M. Sparks and G. Siegfried Kutter.* **321**, 394, 126-E1 (1987)
- The Production of ^{26}Al in Supermassive Stars and the Gamma-Ray Line Flux from the Galactic Center. *Wolfgang Hillebrandt, Friedrich-Karl Thielemann, and Norbert Langer.* **321**, 761, 132-G7 (1987)
- The s-Process Nucleosynthesis of Barium Stars. *Robert A. Malaney.* **321**, 832, 133-E13 (1987)
- Measurements of the ^3He Abundance in the Interstellar Medium. *T. M. Bania, Robert T. Rood, and T. L. Wilson.* **323**, 30, 153-D3 (1987)
- Positron Annihilation Gamma Rays from Novae. *Mark D. Leising and Donald D. Clayton.* **323**, 159, 154-G4 (1987)
- Nuclear Chronometers from the r-Process and the Age of the Galaxy. *John J. Cowan, F.-K. Thielemann, and J. W. Truran.* **323**, 543, 160-F1 (1987)
- ^{16}O Excesses in Murchison and Murray Hironites: A Case Against a Late Supernova Injection Origin of Isotopic Anomalies in O, Mg, Ca, and Ti. *A. J. Fahey, J. N. Goswami, K. D. McKeegan, and E. K. Zinner.* **323**, L91, 158-G5 (1987)
- Numerical Methods**
- A New Method to Optimize Parameters in Solutions of Eclipsing Binary Light Curves. *Josef Kallrath and Albert P. Linnell.* **313**, 346, 18-F11 (1987)
- Variability Analysis in Low Count Rate Sources. *A. Collura, A. Maggio, S. Sciortino, S. Serio, G. S. Vaiana, and R. Rosner.* **315**, 340, 43-E11 (1987)
- Profiles of Clusters of Galaxies: Cosmological Scenarios versus Observations. *Michael J. West, Avishai Dekel, and Augustus Oemler, Jr.*

Numerical Methods—Continued

- 316, 1, 50-A8 (1987)
 Large-Scale Clustering of Galaxies with Massive Dark Halos. II. Mass-to-Light Profiles and Dynamical Mass Estimates of Galaxy Groups. *August E. Evrard*. **316**, 36, 50-D6 (1987)
 Evolution of *N*-Body Systems with Tidally Captured Binaries through the Core Collapse Phase. *Thomas S. Statler, Jeremiah P. Ostriker, and Haldan N. Cohn*. **316**, 626, 58-G9 (1987)
 Solar Oscillations: A Method for Deriving Nonlinear Effects. *Donat G. Wentzel*. **317**, 477, 69-B10 (1987)
 A Fluid Model for the Evolution of Large-Scale Structure. *P. J. E. Peebles*. **317**, 576, 72-D8 (1987)
 Use of a Minimum Rate of Change Formalism to Quantify Variability of Extragalactic X-Ray Sources. *Daniel A. Schwartz*. **318**, 568, 87-B7 (1987)
 The Dynamics of Small Groups of Galaxies. I. Virialized Groups. *Gary A. Mamon*. **321**, 622, 131-D2 (1987)
 The Effect of Heating from the Boundary Layer on Accretion Models for Novae and Other Compact Objects. *Giora Shaviv and Sumner Starrfield*. **321**, L51, 129-F3 (1987)
 Comparisons of the Spatial Distribution of Abell Clusters against Models with Gaussian Initial Conditions. *David J. Batuski, Adrian L. Melott, and Jack O. Burns*. **322**, 48, 138-D12 (1987)
 Optical Bias and Hierarchical Clustering. *Silvio A. Bonometto, Francesco Lucchin, and Sabino Matarrese*. **323**, 19, 153-C6 (1987)
 Three-dimensional Hydrodynamical Simulations of Stellar Collisions. I. Equal-Mass Main-Sequence Stars. *W. Benz and J. G. Hills*. **323**, 614, 161-D9 (1987)
 Performance Characteristics of Tree Codes. *Lars Hernquist*. **64**, 715, 27-F2 (1987) (Abstr. in **318**, 946, 91-C11)
 The Accuracy of Cross-Correlation Estimates of Quasar Emission-Line Region Sizes. *C. Martin Gaskell and Bradley M. Peterson*. **65**, 1, 28-A5 (1987) (Abstr. in **319**, 1011, 106-A9)

Occultations

- Finsens 342 and the Hyades Distance Modulus. *Deane M. Peterson and Richard Solensky*. **315**, 286, 43-A13 (1987)
 Milliarsecond Resolution Infrared Observations of Young Stars in Taurus and Ophiuchus. *M. Simon, R. R. Howell, A. J. Longmore, B. A. Wilking, D. M. Peterson, and W.-P. Chen*. **320**, 344, 111-G3 (1987)

Opacities

- Collective Effects on Thomson Scattering in the Solar Interior. *David B. Boercker*. **316**, L95, 62-D12 (1987)
 On the Source of the Violet Depression in Carbon Stars: A Study of the Balmer Decrement in Carbon Long-Period Variables. *Maria Antonietta Orlati*. **317**, 819, 75-A6 (1987)
 Optical Properties of Interstellar Graphite and Silicate Grains: Erratum. *B. T. Draine and Hyung Mok Lee*. **318**, 485, 84-C4 (1987) (Orig. paper in **285**, 89, 111-A3)
 Effect of Ion Correlations on Free-Free Opacities. *N. R. Dagdeviren and S. E. Koonin*. **319**, 192, 95-B3 (1987)
 Evolution of Very Low Mass Stars and Brown Dwarfs. II. The Population II. *Francesca D'Antona*. **320**, 653, 117-A1 (1987)
 OH and CH Continuous Opacity in Solar and Stellar Atmospheres. *Robert L. Kurucz, Ewine F. van Dishoeck, and S. P. Tarafdar*. **322**, 992, 150-F13 (1987)
 Reexamination of the Metal Contribution to Astrophysical Opacity. *C. A. Iglesias, F. J. Rogers, and B. G. Wilson*. **322**, L45, 145-D2 (1987)
 Relativistic Free-free Gaunt Factor of the Dense High-Temperature Stellar Plasma. *Masayuki Nakagawa, Yasuharu Kohyama, and Naoki Itoh*. **63**, 661, 10-E14 (1987) (Abstr. in **313**, 930, 26-G13)
 Tabulated Optical Properties of Graphite and Silicate Grains: Erratum. *B. T. Draine*. **64**, 505, 23-C11 (1987) (Abstr. in **289**, 861, 21-F4)

Particle Acceleration

- Ultra-High Energy Cosmic Rays in a Galactic Wind and Its Termination Shock. *J. R. Jokipii and G. Morfill*. **312**, 170, 2-G5 (1987)
 High Spectral Resolution Measurements of a Solar Flare Hard X-Ray Burst. *R. P. Lin and R. A. Schwartz*. **312**, 462, 6-A1 (1987)
 Nonstochastic Prompt Proton Acceleration by Fast Magnetosonic Shocks in the Solar Plasma. *Yukihiro Ohsawa and Jun-ichi Sakai*. **313**, 440, 19-G4 (1987)
 Rate of Energy Gain and Maximum Energy in Diffusive Shock Acceleration. *J. R. Jokipii*. **313**, 842, 26-A2 (1987)
 Radiation from Relativistic Beams Interacting with Interstellar Gas. *W. K. Rose, J. H. Beall, J. Guillery, and S. Kainer*. **314**, 95, 29-A12 (1987)
 On the Acceleration of Charged Particles at Relativistic Shock Fronts. *J. G. Kirk and P. Schneider*. **315**, 425, 45-D1 (1987)
 Electron Cyclotron Harmonic Wave Acceleration. *H. Karimabadi, C.*

- R. Menyuk, P. Sprangle, and L. Vlahos*. **316**, 462, 55-B2 (1987)
 Distributed Reacceleration of Cosmic Rays. *Amri Wandel, David Eichler, John R. Letaw, Rein Silberberg, and C. H. Tsao*. **316**, 676, 59-D13 (1987)
 On the Origin of the Pion-Decay Radiation in the 1982 June 3 Solar Flare. *R. Ramaty, R. J. Murphy, and C. D. Dermer*. **316**, L41, 56-D3 (1987)
 An Instability of Radiative Acceleration. *J. I. Katz*. **317**, 264, 66-G3 (1987)
 Calculation of the Mean Equilibrium Charges of Energetic Ions after Passing through a Hot Plasma. *A. Luhn and D. Hovestadt*. **317**, 852, 75-D1 (1987)
 Diffusive Shock Acceleration: Comparison of a Unified Shock Model to Bow Shock Observations. *Donald C. Ellison and Eberhard Möbius*. **318**, 474, 84-B6 (1987)
 Hydrodynamical Constraints on Cosmic-Ray Acceleration in Relativistic Shocks. *G. M. Webb*. **319**, 215, 95-C12 (1987)
 Pair Production and Compton Scattering in Compact Sources and Comparison to Observations of Active Galactic Nuclei. *Alan P. Lightman and Andrzej A. Zdziarski*. **319**, 643, 102-A7 (1987)
 A Simulation of High-Energy Cosmic-Ray Propagation. *M. Honda*. **319**, 836, 104-B7 (1987)
 Energetic Particle Acceleration in Spherically Symmetric Accretion Flows and Shocks. *G. M. Webb and T. J. Bogdan*. **320**, 683, 117-C4 (1987)
 Antiproton Production of Propagating Cosmic Rays under Distributed Reacceleration. *Manfred Simon, U. Heinbach, and Ch. Koch*. **320**, 699, 117-D6 (1987)
 Electron Injection by Relativistic Protons in Active Galactic Nuclei. *Marek Sikora, John G. Kirk, Mitchell C. Begelman, and Peter Schneider*. **320**, L81, 121-B1 (1987)
 Relativistic Transport Theory for Cosmic Rays: Erratum. *G. M. Webb*. **321**, 606, 128-G2 (1987) (Orig. paper in **296**, 319, 93-D7)
 Particle Acceleration at Shocks: A Monte Carlo Method. *J. G. Kirk and P. Schneider*. **322**, 256, 140-F2 (1987)
 A Multispacecraft Study of the Injection and Transport of Solar Energetic Particles. *J. Beeck, G. M. Mason, D. C. Hamilton, G. Wibberenz, H. Kunow, D. Hovestadt, and B. Klecker*. **322**, 1052, 151-D14 (1987)
 The α -Effect Generated by Random Alfvén Waves in a Stratified Atmosphere and Particle Acceleration. *Tomikazu Namikawa, Hiromitsu Hamabata, and Hiroyuki Wada*. **323**, 414, 157-F3 (1987)
 Origin and Acceleration of 10^{20} eV Cosmic-Ray Protons. *Wilfred H. Sorrell*. **323**, 647, 161-G1 (1987)
 Solar Flare Neutron and Accelerated Ion Angular Distributions. *X.-M. Hua and R. E. Lingenfelter*. **323**, 779, 163-C8 (1987)
 Fermi Acceleration at Shocks with Arbitrary Velocity Profiles. *Peter Schneider and John G. Kirk*. **323**, L87, 158-G1 (1987)
 High-Energy Processes in Solar Flares. *R. J. Murphy, C. D. Dermer, and R. Ramaty*. **63**, 721, 11-D13 (1987) (Abstr. in **313**, 931, 26-G14)
 Cosmic Ray Propagation in the Galaxy and in the Heliosphere: The Path-Length Distribution at Low Energy. *M. Garcia-Munoz, J. A. Simpson, T. G. Guzik, J. P. Wefel, and S. H. Margolis*. **64**, 269, 19-F6 (1987) (Abstr. in **315**, 733, 48-E14)

Photometry

- The Hiss of BL Lacertae. *Richard L. Moore, Gary D. Schmidt, and Steven C. West*. **314**, 176, 29-G10 (1987)
 Main-Sequence CCD Photometry of the Globular Cluster NGC 362. *Michael Bolte*. **315**, 469, 45-G6 (1987)
 Infrared Photometry and Spectroscopy of Supernova 1986g in NGC 5128—Centaurus A. *Jay A. Frogel, Brooke Gregory, Kimiaki Kawara, Dave Laney, M. M. Phillips, Don Terndrup, Frederick Vrba, and Albert E. Whitford*. **315**, L129, 49-E11 (1987)
 Deep CCD Photometry in Globular Clusters. V. M5. *Harvey B. Richer and Gregory G. Fahlman*. **316**, 189, 52-A13 (1987)
 IRAS 1809—3211: Optically Known as “Gomez’s Hamburger”. *Maria Teresa Ruiz, Victor Blanco, José Maza, Steve Heathcote, Andrew Phillips, Kimiaki Kawara, Claudio Anguita, Mario Hamuy, and Arturo Gomez*. **316**, L21, 56-B10 (1987)
 Spectroscopy and JHK Photometry of Type II Cepheids in the Magellanic Clouds. *Douglas L. Welch*. **317**, 672, 73-D6 (1987)
 Photometry of SS 433 over 7 Years: Study of Two Periodicities. *Tsevi Mazeh, James C. Kemp, Elia M. Leibowitz, Herbert Meninger, and Haim Mendelson*. **317**, 824, 75-A13 (1987)
 Surface Brightness Profiles of 10 Comets. *D. C. Jewitt and Karen J. Meech*. **317**, 992, 77-A7 (1987)
 BVI CCD Photometry of 47 Tucanae. *Gonzalo Alcaino and William Liller*. **319**, 304, 96-C9 (1987)
 Deep CCD Photometry of the Globular Cluster NGC 7099. *Michael Bolte*. **319**, 760, 103-D1 (1987)

- Near-Infrared Observations of Cepheids: The Distance to NGC 300. *Barry F. Madore, Douglas L. Welch, C. W. McAlary, and R. A. McLaren.* **320**, 26, 108-C4 (1987)
- CCD Photometry of Globular Cluster Core Structure. I. NGC 6388, NGC 6624, and M15—One Flat Core and Two Cusps. *Phyllis M. Lugger, Haldan Cohn, Jonathan E. Grindlay, Charles D. Bailyn, and Paul Hertz.* **320**, 482, 114-F8 (1987)
- Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. *V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storchi-Bergmann, and J. Matthews.* **320**, 589, 116-B3 (1987)
- CCD Photometry of Large Magellanic Cloud Clusters. IV. The Metal-rich, Remote Southern Cluster LW 79. *Mario Mateo and Paul Hodge.* **320**, 626, 116-D14 (1987)
- IRAS 18059 – 3211: Optically Known As Gomez's Hamburger: Erratum. *M. T. Ruiz, V. Blanco, J. Maza, S. Heathcote, A. Phillips, K. Kawara, C. Anguita, M. Hamuy, and A. Gomez.* **320**, L157, 121-F14 (1987) (Orig. paper in **316**, L21, 56-B10)
- Distance Moduli and Structure of the Magellanic Clouds from Near-Infrared Photometry of Classical Cepheids. *Douglas L. Welch, Robert A. McLaren, Barry F. Madore, and Christopher W. McAlary.* **321**, 162, 124-A7 (1987)
- The Activity, Variability, and Rotation of Lower Main-Sequence Hyades Stars. *Richard R. Radick, D. T. Thompson, G. W. Lockwood, D. K. Duncan, and W. E. Baggett.* **321**, 459, 127-B10 (1987)
- A Preliminary Survey of Collapsed Cores in the Magellanic Clouds' Globular Clusters. *G. Meylan and S. Djorgovski.* **322**, L91, 152-C10 (1987)
- Collapsed Cores and the Structural Parameters of Old Large Magellanic Cloud Star Clusters. *Mario Mateo.* **323**, L41, 158-C12 (1987)
- Theoretical Isochrones for Globular Clusters with Predicted Thuan-Gunn Photometry. *R. A. Bell and Don A. Vandenberg.* **63**, 335, 5-D10 (1987) (Abstr. in **312**, 966, 13-E7)
- Photometry and Spectroscopy of Short-Period Cataclysmic Variables. *Paula Szkody.* **63**, 685, 11-B3 (1987) (Abstr. in **313**, 930, 26-G13)
- RICHLFD Photometry of NGC 6723. *Donald H. Martins and Dorothy A. Fraquelli.* **65**, 83, 28-G2 (1987) (Abstr. in **319**, 1012, 106-A10)
- The Early A Type Stars: Refined MK Classification, Confrontation with Strömgen Photometry, and the Effects of Rotation. *R. O. Gray and R. F. Garrison.* **65**, 581, 37-C1 (1987) (Abstr. in **322**, 1076, 151-G2)
- Planets: Abundances**
- Experimental Study of Erosion of Methane Ice by Energetic Ions and Some Considerations for Astrophysics. *L. J. Lanzerotti, W. L. Brown, and K. J. Marcantonio.* **313**, 910, 26-F7 (1987)
- Collision-induced Rototranslational Absorption Spectra of CH₄-CH₄ Pairs at Temperatures from 50 to 300 K. *Aleksandra Borysow and Lothar Frommhold.* **318**, 940, 91-C2 (1987)
- Planets: Atmospheres**
- Collision-induced Rototranslational Absorption Spectra of N₂-N₂ Pairs for Temperatures from 50 to 300 K: Erratum. *Aleksandra Borysow and Lothar Frommhold.* **320**, 437, 112-G4 (1987) (Orig. paper in **311**, 1043, 160-C6)
- The Role of Aqueous Chemistry in Determining the Composition and Cloud Structure of the Upper Troposphere of Uranus. *Barbara E. Carlson, Michael J. Prather, and William B. Rossow.* **321**, L97, 130-B3 (1987)
- Cloud Chemistry on Jupiter. *Barbara E. Carlson, Michael J. Prather, and William B. Rossow.* **322**, 559, 144-A11 (1987)
- Planets: Formation**
- Kinematics of the Circumstellar Gas of HL Tauri and R Monocerotis. *Anneila I. Sargent and Steven Beckwith.* **323**, 294, 156-C5 (1987)
- Planets: General**
- Experimental Study of Erosion of Methane Ice by Energetic Ions and Some Considerations for Astrophysics. *L. J. Lanzerotti, W. L. Brown, and K. J. Marcantonio.* **313**, 910, 26-F7 (1987)
- Planets: Interiors**
- Hydromagnetic Constraints on Deep Zonal Flow in the Giant Planets. *R. L. Kirk and D. J. Stevenson.* **316**, 836, 61-C4 (1987)
- Planets: Jupiter**
- Centrifugal Field Line Breaking: An Upper Limit to Io Mass Injection. *T. S. Huang and G. L. Siscoe.* **312**, 475, 6-B1 (1987)
- Jovian Electrons at 1 AU: 1978–1984. *Dan Moses.* **313**, 471, 20-B8 (1987)
- Detection of Neutral Oxygen and Sulfur Emissions near Io Using IUE. *G. E. Ballester, H. W. Moos, P. D. Feldman, D. F. Strobel, M. E. Summers, J.-L. Bertaux, T. E. Skinner, M. C. Festou, and J. H. Lieske.* **319**, L33, 100-D1 (1987)
- Cloud Chemistry on Jupiter. *Barbara E. Carlson, Michael J. Prather, and William B. Rossow.* **322**, 559, 144-A11 (1987)
- Planets: Magnetospheres**
- Centrifugal Field Line Breaking: An Upper Limit to Io Mass Injection. *T. S. Huang and G. L. Siscoe.* **312**, 475, 6-B1 (1987)
- Beaming of Uranian Kilometric Radiation and Implications for the Planetary Magnetic Field. *D. D. Barbosa.* **315**, L151, 49-G6 (1987)
- Corotation Lag Limit on Mass-Loss Rate from Io. *T. S. Huang and G. L. Siscoe.* **319**, 1003, 106-A1 (1987)
- Planetary Fast Neutral Emission and Effects on the Solar Wind: A Cometary Exosphere Analog: Erratum. *D. D. Barbosa and A. Eviar.* **321**, 1049, 136-A1 (1987) (Orig. paper in **310**, 927, 144-B10)
- Planets: Radio Radiation**
- Beaming of Uranian Kilometric Radiation and Implications for the Planetary Magnetic Field. *D. D. Barbosa.* **315**, L151, 49-G6 (1987)
- Planets: Satellites**
- Centrifugal Field Line Breaking: An Upper Limit to Io Mass Injection. *T. S. Huang and G. L. Siscoe.* **312**, 475, 6-B1 (1987)
- Corotation Lag Limit on Mass-Loss Rate from Io. *T. S. Huang and G. L. Siscoe.* **319**, 1003, 106-A1 (1987)
- Detection of Neutral Oxygen and Sulfur Emissions near Io Using IUE. *G. E. Ballester, H. W. Moos, P. D. Feldman, D. F. Strobel, M. E. Summers, J.-L. Bertaux, T. E. Skinner, M. C. Festou, and J. H. Lieske.* **319**, L33, 100-D1 (1987)
- Collision-induced Rototranslational Absorption Spectra of N₂-N₂ Pairs for Temperatures from 50 to 300 K: Erratum. *Aleksandra Borysow and Lothar Frommhold.* **320**, 437, 112-G4 (1987) (Orig. paper in **311**, 1043, 160-C6)
- Planetary Fast Neutral Emission and Effects on the Solar Wind: A Cometary Exosphere Analog: Erratum. *D. D. Barbosa and A. Eviar.* **321**, 1049, 136-A1 (1987) (Orig. paper in **310**, 927, 144-B10)
- Planets: Saturn**
- Features in Saturn's Rings. *Larry W. Esposito, Craig C. Harris, and Karen E. Simmons.* **63**, 749, 11-G1 (1987) (Abstr. in **313**, 931, 26-G14)
- Planets: Spectra**
- Effective Collision Strengths for Electron Impact Excitation in S II. *S. Tayal, J. W. Henry, and S. Nakazaki.* **313**, 487, 20-C10 (1987)
- Planets: Uranus**
- Beaming of Uranian Kilometric Radiation and Implications for the Planetary Magnetic Field. *D. D. Barbosa.* **315**, L151, 49-G6 (1987)
- The Role of Aqueous Chemistry in Determining the Composition and Cloud Structure of the Upper Troposphere of Uranus. *Barbara E. Carlson, Michael J. Prather, and William B. Rossow.* **321**, L97, 130-B3 (1987)
- Plasmas**
- Radiation Gas Dynamics of Polar Cap Accretion onto Magnetized Neutron Stars: Basic Theory. *Jonathan Arons, Richard I. Klein, and Susan M. Lea.* **312**, 666, 10-C1 (1987)
- Nonstochastic Prompt Proton Acceleration by Fast Magnetosonic Shocks in the Solar Plasma. *Yukiharu Ohsawa and Jun-ichi Sakai.* **313**, 440, 19-G4 (1987)
- A Comparison of the C III, O V, F VI, and Ne VII $\Delta n = 0(2-2)$ Line Emissions from a Laboratory Plasma with Theoretical Predictions and Astrophysical Observations. *M. Finkenthal, T. L. Yu, S. Lippmann, L. K. Huang, H. W. Moos, B. C. Stratton, A. K. Bhatia, R. D. Bengtson, W. L. Hodge, P. E. Phillips, J. L. Porter, T. R. Price, T. L. Rhodes, B. Richards, C. P. Ritz, and W. L. Rowan.* **313**, 920, 26-G3 (1987)
- Radiation from Relativistic Beams Interacting with Interstellar Gas. *W. K. Rose, J. H. Beall, J. Guillory, and S. Kainer.* **314**, 95, 29-A12 (1987)
- Theoretical Non-Maxwellian Particle Velocity Distribution Functions for Spherically Symmetric Solar Wind-like Plasma Systems and Consequences. II. The Case of Large Thermal Anisotropy and Nine Moments Description for Each Species. *S. Cuiperman, H. Yatani, M. Dryer, and D. Lewis.* **314**, 404, 32-E11 (1987)
- A Computational Code for Two-dimensional Unsteady Magnetohydrodynamics by the Method of Characteristics. *Y. Q. Lou, R. Rosner, and P. Ulmschneider.* **315**, 349, 43-F6 (1987)
- Solar Wind Diagnostics from Doppler-enhanced Scattering. *Giancarlo Noci, John L. Kohl, and George L. Withbroe.* **315**, 706, 48-D1 (1987)
- The Plasma and Magnetic Field Properties of Coronal Loops Observed at High Spatial Resolution. *D. F. Webb, G. D. Holman, J. M. Davis, M. R. Kundu, and R. K. Shevgaonkar.* **315**, 716, 48-D11 (1987)
- Heating of the Solar Corona by the Resonant Absorption of Alfvén Waves. *Joseph M. Davila.* **317**, 514, 69-E4 (1987)
- Calculation of the Mean Equilibrium Charges of Energetic Ions after Passing through a Hot Plasma. *A. Luhn and D. Hovestadt.* **317**, 852, 75-D1 (1987)

Plasmas—Continued

- Nonlinear Radiative Condensation in a Sheared Magnetic Field. G. Van Hoven, L. Sparks, and D. D. Schnack. **317**, L91, 78-D9 (1987)
- Statistical Mechanics of Partially Ionized Stellar Plasmas: The Planck-Larkin Partition Function, Polarization Shifts, and Simulations of Optical Spectra. Werner Däppen, Lawrence Anderson, and Dimitri Mihalas. **319**, 195, 95-B6 (1987)
- Alfvén Wave Dissipation in the Solar Atmosphere. G. Einaudi and Yung Mok. **319**, 520, 99-A1 (1987)
- Corotation Lag Limit on Mass-Loss Rate from Io. T. S. Huang and G. L. Siscoe. **319**, 1003, 106-A1 (1987)
- Magnetic Braking in Weakly Ionized Media. Ariele Königl. **320**, 726, 117-F6 (1987)
- Relativistic Thermal Plasmas: Time Development of Electron-Positron Pair Concentration. Masaaki Kusunose. **321**, 186, 124-C3 (1987)
- Magnetic Monopole Plasma Oscillations and the Survival of Galactic Magnetic Fields. E. N. Parker. **321**, 349, 126-A11 (1987)
- Generation of Plasma Waves by Thick-Target Electron Beams and the Expected Radiation Signature. Russell J. Hamilton and Vahé Petrosian. **321**, 721, 132-D6 (1987)
- H₂O Line Emission from Shocked Gas. David A. Neufeld and Gary J. Melnick. **322**, 266, 140-F12 (1987)
- Evolution of the Axial Electron Cyclotron Maser Instability, with Applications to Solar Microwave Spikes. Loukas Vlahos and Phillip Sprangle. **322**, 463, 143-A10 (1987)
- Partial Redistribution in High-Density, Highly Ionized Plasmas. B. Talin, R. Stamm, V. P. Kafandjian, and Lewis Klein. **322**, 804, 148-E12 (1987)
- The Infrared Diagnostic of a Dusty Plasma with Applications to Supernova Remnants. Eli Dwek. **322**, 812, 148-F6 (1987)
- VLA and Low-Frequency VLBI Observations of the Radio Source 0503 + 467: Austere Constraints on Interstellar Scattering in Two Media. Steven R. Spangler, Alan L. Fey, and James M. Cordes. **322**, 909, 149-G3 (1987)
- Physical Constraints on Variable Eddington Factors for the Gray Problem in Radiative Transfer. Albert Fu. **323**, 227, 155-E3 (1987)
- On the Controversy Concerning Turbulent Bremsstrahlung. D. B. Melrose and J. Kuipers. **323**, 338, 156-F7 (1987)
- Cerenkov Damping of Surface Waves. Altair S. Assis and J. Burnardo-Neto. **323**, 399, 157-D10 (1987)
- Effects of Electron Scattering on the Oscillations of an X-Ray Source. Nikolaos D. Kylafis and George S. Klimis. **323**, 678, 162-B8 (1987)
- Fermi Acceleration at Shocks with Arbitrary Velocity Profiles. Peter Schneider and John G. Kirk. **323**, L87, 158-G1 (1987)
- Spheromak Model of Planetary Nebulae. Charles L. Bennett. **323**, L123, 164-C7 (1987)
- Relativistic Free-free Gaunt Factor of the Dense High-Temperature Stellar Plasma. Masayuki Nakagawa, Yasuhiro Kohyama, and Naoki Itoh. **63**, 661, 10-E14 (1987) (Abstr. in **313**, 930, 26-G13)
- Polarization**
- Microwave Observations of Flare Stars UV Ceti, AT Microscopii, and AU Microscopii. M. R. Kundu, P. D. Jackson, S. M. White, and M. Melozzi. **312**, 822, 12-A1 (1987)
- Simultaneous Multifrequency Observations of the BL Lacertae Object Markarian 421. F. Makino, Y. Tanaka, M. Matsuoka, K. Koyama, H. Inoue, K. Makishima, R. Hoshi, S. Hayakawa, Y. Kondo, C. M. Urry, S. L. Mufson, K. R. Hackney, L. R. Hackney, S. Kikuchi, Y. Mikami, W. Z. Wisniewski, N. Hiromoto, M. Nishida, J. Burnell, P. Brand, P. M. Williams, M. G. Smith, F. Takahara, M. Inoue, M. Tsuboi, H. Tabara, T. Kato, M. F. Aller, and H. D. Aller. **313**, 662, 24-A12 (1987)
- A Bright Optical Synchrotron Counterpart of the Western Hot Spot in Pictor A. Hermann-Josef Röser and Klaus Meisenheimer. **314**, 70, 28-G1 (1987)
- Amplification and Polarization of Supernovae by Gravitational Lensing. P. Schneider and Robert V. Wagoner. **314**, 154, 29-F2 (1987)
- The Hiss of BL Lacertae. Richard L. Moore, Gary D. Schmidt, and Steven C. West. **314**, 176, 29-G10 (1987)
- Orthogonal Polarization Modes in PSR 0834 + 06. Janusz A. Gil. **314**, 629, 36-D7 (1987)
- 1E 1048.5 + 5421: A New 114 Minute AM Herculis Binary. Simon L. Morris, Gary D. Schmidt, James Liebert, John Stocke, Isabella M. Gioia, and Tommaso Maccacaro. **314**, 641, 36-E8 (1987)
- Optical Color, Polarimetric, and Timing Measurements of the 50 Millisecond Large Magellanic Cloud Pulsar, PSR 0540 - 69. J. Middleton, C. R. Pennypacker, and M. S. Burns. **315**, 142, 41-E8 (1987)
- Polarimetry of the NGC 2261/R Monocerotis System and the Faint Jetlike Feature to its Southwest. R. F. Warren-Smith, P. W. Draper, and S. M. Scarrott. **315**, 500, 46-B11 (1987)
- Astrophysical Implications of the Multifrequency VLA Observations of NGC 1265. Christopher P. O'Dea and Frazer N. Owen. **316**, 95, 51-A11 (1987)
- Interdependence of the 4430 Å Diffuse Interstellar Band, Polarization, and Ultraviolet Extinction. J. Krelowski, G. A. H. Walker, G. R. Grieve, and G. M. Hill. **316**, 449, 55-A3 (1987)
- The Radio Morphology of 3C 120 on Scales from 0.5 Parsecs to 400 Kiloparsecs. R. C. Walker, J. M. Benson, and S. C. Unwin. **316**, 546, 58-A5 (1987)
- The Faraday Rotation of Cygnus A: Magnetic Fields in Cluster Gas. J. W. Dreher, C. L. Carilli, and R. A. Perley. **316**, 611, 58-F7 (1987)
- IRAS 1809 - 3211: Optically Known as "Gomez's Hamburger". Maria Teresa Ruiz, Victor Blanco, José Maza, Steve Heathcote, Andrew Phillips, Kimiaki Kawara, Claudio Anguita, Mario Hamuy, and Arturo Gómez. **316**, L21, 56-B10 (1987)
- Shock-Front Compression of the Magnetic Field in the Canis Major R1 Star Formation Region. F. J. Vrba, R. Baierlein, and W. Herbst. **317**, 207, 66-C4 (1987)
- Polarization, Jets, and the Distribution of Circumstellar Dust around T Tauri Stars and Other Young Infrared Sources. Pierre Bastien. **317**, 231, 66-D12 (1987)
- Polarization of Light Scattered from the Winds of Early-Type Stars. J. P. Cassinelli, K. H. Nordieck, and M. A. Murison. **317**, 290, 67-B1 (1987)
- Cylindrical Astrophysical Maser Models: Polarization Due to Magnetic Fields. L. R. Western. **317**, 858, 75-D7 (1987)
- Discovery of Optical Circular Polarization in Lambda Andromedae. J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook. **317**, L29, 71-C2 (1987)
- Absorption Features from the Accretion Column in E1405 - 451. D. T. Wickramasinghe, I. R. Tuohy, and N. Visvanathan. **318**, 326, 82-D8 (1987)
- Optical Properties of Interstellar Graphite and Silicate Grains: Erratum. B. T. Draine and Hyung Mok Lee. **318**, 485, 84-C4 (1987) (Orig. paper in **285**, 89, 111-A3)
- A Radiative Bow Shock Wave (?) Driven by Nuclear Ejecta in a Seyfert Galaxy. Andrew S. Wilson and James S. Ulvestad. **319**, 105, 94-B11 (1987)
- VLA Observations of a Solar Noise Storm. Kenneth R. Lang and Robert F. Willson. **319**, 514, 98-G8 (1987)
- The Pleiades Cluster. IV. The Visit of a Molecular CO Cloud. Michel Breger. **319**, 754, 103-C9 (1987)
- The Magnetic Field in Star-forming Large Globules. Klaus-Werner Hodapp. **319**, 842, 104-B13 (1987)
- A Shocked-Jet Model of the Galactic Center Bridge and the Radio Arc. Yoshiaki Sofue and Mitsuaki Fujimoto. **319**, L73, 107-D11 (1987)
- Polarized Radiation from Extended Magnetic Polar Caps. G. Channugam and J. Frank. **320**, 746, 118-A1 (1987)
- IRAS 18059 - 3211: Optically Known As Gomez's Hamburger: Erratum. M. T. Ruiz, V. Blanco, J. Maza, S. Heathcote, A. Phillips, K. Kawara, C. Anguita, M. Hamuy, and A. Gomez. **320**, L157, 121-F14 (1987) (Orig. paper in **316**, L21, 56-B10)
- The Magnetic Evolution of the Taurus Molecular Clouds. I. Large-scale Properties. Mark H. Heyer, Frederick J. Vrba, Ronald L. Snell, F. P. Schloerb, Stephen E. Strom, Paul F. Goldsmith, and Karen M. Strom. **321**, 855, 133-G9 (1987)
- Stokes Profile Analysis and Vector Magnetic Fields. I. Inversion of Photospheric Lines. A. Skumanich and B. W. Lites. **322**, 473, 143-B8 (1987)
- The Polarization Properties of Model Sunspots: The Broad-Band Polarization Signature of the Schlüter-Temesváry Representation. A. Skumanich and B. W. Lites. **322**, 483, 143-C4 (1987)
- Inverse Compton Scattering of Ambient Radiation by a Cold Relativistic Jet: A Source of Beamed, Polarized Continuum in Blazars? Mitchell C. Begelman and Marek Sikora. **322**, 650, 146-G12 (1987)
- The Linear Filaments of the Radio Arc near the Galactic Center. Farhad Yusef-Zadeh and Mark Morris. **322**, 721, 147-F7 (1987)
- Polarization Variability among Wolf-Rayet Stars. I. Linear Polarization of a Complete Sample of Southern Galactic WC Stars. Nicole St-Louis, Laurent Drissen, Anthony F. J. Moffat, Pierre Bastien, and Santiago Tapia. **322**, 870, 149-C13 (1987)
- Polarization Variability among Wolf-Rayet Stars. II. Linear Polarization as a Complete Sample of Southern Galactic WN Stars. Laurent Drissen, Nicole St-Louis, Anthony F. J. Moffat, and Pierre Bastien. **322**, 888, 149-E5 (1987)
- The Discovery of Near-Infrared Polarized Cyclotron Emission in the Intermediate Polar BG Canis Minoris. Steven C. West, Graham Berriman, and Gary D. Schmidt. **322**, L35, 145-C7 (1987)
- Proton-Electron Bremsstrahlung Polarization: Solar Flare X-Ray and Gamma-Ray Polarization. D. Heristchi. **323**, 391, 157-D2 (1987)

- Linear Polarization Structure of the BL Lacertae Object OJ 287 at Milliarcsecond Resolution. *D. H. Roberts, D. C. Gabuzda, and J. F. C. Wardle*. **323**, 536, 160-E5 (1987)
- Optical and Near-Infrared Observations of BL Lacertae Objects and Active Quasars. *Paul S. Smith, Thomas J. Balonek, Richard Elston, and Paul A. Heckert*. **64**, 459, 22-G9 (1987) (Abstr. in **316**, 860, 61-E2)
- Pulsars**
- Pulsar Activation by the Interstellar Medium? *F. Curtis Michel*. **312**, 271, 3-G8 (1987)
- Improved Dispersion Measures for 17 Pulsars. *T. H. Hankins*. **312**, 276, 3-B13 (1987)
- Radiation Gas Dynamics of Polar Cap Accretion onto Magnetized Neutron Stars: Basic Theory. *Jonathan Arons, Richard I. Klein, and Susan M. Lea*. **312**, 666, 10-C1 (1987)
- Discovery of 5 Hz Quasi-periodic Oscillations in Cygnus X-2. *J. P. Norris and K. S. Wood*. **312**, 732, 11-A1 (1987)
- Electromagnetic Cascades in the Magnetosphere of a Very Young Pulsar: A Model for the Positron Production near the Galactic Center. *Apostolos Mastichiadis, Kenneth Brecher, and Alan P. Marscher*. **314**, 88, 29-A5 (1987)
- G0.9 + 0.1 and the Emerging Class of Composite Supernova Remnants. *D. J. Helfand and R. H. Becker*. **314**, 203, 30-C10 (1987)
- Deceleration of Infalling Plasma in the Atmospheres of Accreting Neutron Stars. I. Isothermal Atmospheres. *G. S. Miller, E. E. Salpeter, and I. Wasserman*. **314**, 215, 30-D13 (1987)
- Orthogonal Polarization Modes in PSR 0834 + 06. *Janusz A. Gil*. **314**, 629, 36-D7 (1987)
- Apsidal Advance in Vela X-1. *J. E. Deeter, P. E. Boynton, F. K. Lamb, and G. Zylstra*. **314**, 634, 36-E1 (1987)
- A Possible 1.13 Millisecond Periodicity in GX 339 - 4. *James N. Imamura, Thomas Y. Steiman-Cameron, and John Middleditch*. **314**, L11, 33-B13 (1987)
- VLA Observations of the Fast Pulsar Candidate in M28. *W. C. Erickson, M. J. Mahoney, R. H. Becker, and D. J. Helfand*. **314**, L45, 39-B9 (1987)
- Optical Color, Polarimetric, and Timing Measurements of the 50 Millisecond Large Magellanic Cloud Pulsar, PSR 0540 - 69. *J. Middleditch, C. R. Pennypacker, and M. S. Burns*. **315**, 142, 41-E8 (1987)
- Improved Timing of the Millisecond Pulsar PSR 1937 + 21 Using Real-Time Coherent Redispersion. *T. H. Hankins, Daniel R. Stinebring, and Lloyd A. Rawley*. **315**, 149, 41-F1 (1987)
- Two Binary Cycles of GX 301 - 2. *Richard E. Rothschild and Yang Soong*. **315**, 154, 41-F6 (1987)
- Refractive Scintillation in the Interstellar Medium. *W. A. Coles, R. G. Frehlich, B. J. Rickett, and J. L. Codona*. **315**, 666, 48-A1 (1987)
- Pulsar Magnetogyro Ratios and Pulsar Evolution. IV. Peaks in the Pulse Period Number Density Distribution and Short-Period Evolution. *James F. Woodward*. **316**, 743, 60-C1 (1987)
- The Role of the Viscous Secular Instability in Rotating Neutron Stars. *Lee Lindblom*. **317**, 325, 67-D9 (1987)
- Effect of an Electron Scattering Cloud on X-Ray Oscillations Produced by Beaming. *J. Brainerd and F. K. Lamb*. **317**, L33, 71-C6 (1987)
- The Drifting Subpulse Phenomenon Observed in Three Pulsars with Triple Profiles. *T. H. Hankins and A. Wolszczan*. **318**, 410, 83-D8 (1987)
- The Birthrate and Initial Spin Period of Single Radio Pulsars. *Ramesh Narayan*. **319**, 162, 94-G1 (1987)
- Gamma-Ray Pulsar Model. *Jeffrey M. Cohen and Errol Mustafa*. **319**, 930, 105-B5 (1987)
- A Rapid Change of the Hercules X-1 Pulse Profile and High-State Duration. *Yang Soong, Duane E. Gruber, and Richard E. Rothschild*. **319**, L77, 107-E3 (1987)
- Pulsar-like Emission from the Supernova Remnant CTB 80. *Richard G. Strom*. **319**, L103, 107-F13 (1987)
- On Two-Stream Instability in Pulsar Magnetospheres. *V. V. Usov*. **320**, 333, 111-F6 (1987)
- Interstellar Interferometry of the Pulsar PSR 1237 + 25. *A. Wolszczan and J. M. Cordes*. **320**, L35, 114-C11 (1987)
- Shocked Relativistic Magnetohydrodynamic Flows with Application to Pulsar Winds. *Robert T. Emmering and Roger A. Chevalier*. **321**, 334, 125-G10 (1987)
- Optical and X-Ray Radiation from Fast Pulsars: Effects of Duty Cycle and Spectral Shape. *F. Pacini and M. Salvati*. **321**, 447, 127-A12 (1987)
- Monte Carlo Simulations of Radio Pulsars and Their Progenitors. *R. J. Dewey and J. M. Cordes*. **321**, 780, 133-A14 (1987)
- Outer Magnetospheric Fluctuations and Pulsar Timing Noise. *K. S. Cheng*. **321**, 799, 133-C9 (1987)
- Could Glitches Inducing Magnetospheric Fluctuations Produce Low-Frequency Pulsar Timing Noise? *K. S. Cheng*. **321**, 805, 133-C13 (1987)
- A Possible Semisecular Variation in Orbital Period of Binary Pulsar System PSR 1913 + 16 and Lorentz Invariance of Gravity. *K. Nordvedt, Jr.*. **322**, 288, 141-A6 (1987)
- A Pulsar Emission Model: Observational Tests. *F. Curtis Michel*. **322**, 822, 148-G2 (1987)
- Ohmic Decay of Crustal Neutron Star Magnetic Fields. *Yeming Sang and G. Chanmugam*. **323**, L61, 158-E2 (1987)
- Quantum Mechanics**
- Inverse Comptonization by One-dimensional Relativistic Electrons. *E. Canfield, W. M. Howard, and E. P. Liang*. **323**, 565, 161-A1 (1987)
- Quasars**
- The Quadrupole Gravitational Lens. *Israel Kover*. **312**, 22, 1-B14 (1987)
- Detection of the Lensing Galaxy in PG 1115 + 080. *C. A. Christian, D. Crabtree, and P. Waddell*. **312**, 45, 1-D10 (1987)
- High-Resolution Spectroscopy of the $z = 1.79$ Absorption-Line System toward B2 1225 + 317. *Jill Bechtold, Richard F. Green, and D. G. York*. **312**, 50, 1-E5 (1987)
- Imaging Spectroscopy of Five QSOs. *Paul Hickson and J. B. Hutchings*. **312**, 518, 8-E6 (1987)
- The Intensity Ratio in Different Wave Bands between Images of Gravitationally Lensed Quasars as a Probe of Dark Matter. *Kandaswamy Subramanian and S. M. Chitre*. **313**, 13, 15-B5 (1987)
- 1146 + 111B,C: A Giant Gravitational Lens? *R. D. Blandford, E. S. Phinney, and R. Narayan*. **313**, 28, 15-C6 (1987)
- X-Ray Emission Associated with the Jet in 3C 273. *D. E. Harris and C. P. Stern*. **313**, 136, 16-D14 (1987)
- Magnetic Fields in Extragalactic Jets. *William K. Rose*. **313**, 146, 16-E10 (1987)
- Dynamical Heating of Stars as a Fueling Mechanism for Active Galactic Nuclei. *A. J. Allen and P. A. Hughes*. **313**, 152, 16-F2 (1987)
- The Origin of the Photoionizing Continuum of Active Galactic Nuclei and Quasars. *S. L. O'Dell, H. A. Scott, and W. A. Stein*. **313**, 164, 16-F14 (1987)
- The Effect of the Lyman-Alpha Forest on the Ultraviolet Continuum of Very High Redshift Quasars. *Charles C. Steidel and Wallace L. W. Sargent*. **313**, 171, 16-G7 (1987)
- Source Counts in the Chronometric Cosmology. *Edward L. Wright*. **313**, 551, 22-G1 (1987)
- The Evolution of Active Galactic Nuclei. I. Models without Stellar Evolution. *Laurence P. David, Richard H. Durisen, and Haldan N. Cohn*. **313**, 556, 22-G9 (1987)
- X-Ray Studies of Quasars with the EINSTEIN OBSERVATORY. IV. X-Ray Dependence on Radio Emission. *D. M. Worrall, P. Giommi, H. Tananbaum, and G. Zamorani*. **313**, 596, 23-C9 (1987)
- Thermal and Dynamical Effects of Pair Production on Two-Temperature Accretion Flows. *Mitchell C. Begelman, Marek Sikora, and Martin J. Rees*. **313**, 689, 24-C12 (1987)
- IRAS 00521 - 7054: An Unusually Warm Galaxy. *Jay A. Frogel and J. H. Elias*. **313**, L53, 27-B10 (1987)
- Radiation from Relativistic Beams Interacting with Interstellar Gas. *W. K. Rose, J. H. Beall, J. Guillory, and S. Kainer*. **314**, 95, 29-A12 (1987)
- The X-Ray Properties of High-Redshift Quasi-stellar Objects. *Scott F. Anderson and Bruce Margon*. **314**, 111, 29-B14 (1987)
- The Space Distribution of Faint Quasars from the CFHT Survey. *David Crampton, A. P. Cowley, and F. D. A. Hartwick*. **314**, 129, 29-D4 (1987)
- The Ultraviolet Spectra of Intermediate-Redshift Quasars. II. *A. L. Kinney, P. J. Huggins, A. E. Glassgold, and J. N. Bregman*. **314**, 145, 29-E7 (1987)
- X-Ray Spectra of PG Quasars. II. The X-Ray-Ultraviolet Excess of PG 1211 + 143. *Jill Bechtold, Bozena Czerny, Martin Elvis, G. Fabbiano, and Richard F. Green*. **314**, 699, 37-C5 (1987)
- Multipole VLBI Observations of 4C 39.25: Superluminal Motion and Stationary Structure. *David B. Shaffer, Alan P. Marscher, Jon Marcaide, and Jonathan D. Romney*. **314**, L1, 33-B4 (1987)
- The Integrated Ultraviolet Radiation Field from QSOs. *Jill Bechtold, Ray J. Weymann, Zuo Lin, and Matthew A. Malkan*. **315**, 180, 42-A4 (1987)
- The Gravitational Lens System 2016 + 112 Revisited. *D. Narasimha, K. Subramanian, and S. M. Chitre*. **315**, 434, 45-D11 (1987)
- Observations of Weak C IV Absorption toward the QSOs 2000-330 and 2126-158. *David M. Meyer and Donald G. York*. **315**, L5, 45-A8 (1987)
- Gravitational Lenses and Decay of Dark Matter. *Avishai Dekel and Tsvi Piran*. **315**, L83, 49-B6 (1987)
- Evolution of 3C 273 at 10.7 GHz. *M. H. Cohen, J. A. Zensus, J. A. Biretta, G. Comoretto, P. Kaufmann, and Z. Abraham*. **315**, L89, 49-B7 (1987)

Quasars—Continued

- 49-B11 (1987)
- The Thick Gravitational Lens: A Lens Composed of Many Elements at Different Distances. *Israel Kover*. **316**, 52, 50-E10 (1987)
- The Radio Luminosity Function of Optically Selected Quasars. *Herman L. Marshall*. **316**, 84, 50-G14 (1987)
- The Evolution of Active Galactic Nuclei. II. Models with Stellar Evolution. *Laurence P. David, Richard H. Durisen, and Haldan N. Cohn*. **316**, 505, 57-E4 (1987)
- Extended Emission-Line Regions around QSOs. *Alan Stockton and John W. Mackenty*. **316**, 584, 58-D3 (1987)
- Nine Optically Selected Quasars with Redshifts Larger Than 3. *Maarten Schmidt, Donald P. Schneider, and James E. Gunn*. **316**, L1, 56-A4 (1987)
- The Paucity of High-Redshift Quasars and Comparative Cosmology. *I. E. Segal*. **316**, L5, 56-A8 (1987)
- The Amplification Bias by Gravitational Lensing on Observed Number Counts of Quasars: Effects of a Finite Source Size. *Peter Schneider*. **316**, L7, 56-A10 (1987)
- The UV Excess of Quasars: Luminosity Dependence. *Amri Wandel*. **316**, L55, 62-B1 (1987)
- On the Physical State of QSO Lyman- α Absorption Clouds. *Craig J. Hogan*. **316**, L59, 62-B5 (1987)
- Gravitational Lensing by an Ensemble of Isothermal Galaxies. *Neal Katz and Bohdan Paczyński*. **317**, 11, 64-B3 (1987)
- Molecules at Early Epochs. II. H_2 and CO toward PHL 957. *John H. Black, Frederic H. Chaffee, Jr., and Craig B. Foltz*. **317**, 442, 68-G2 (1987)
- The Complex Absorption Spectrum of the Broad Absorption Line QSO 1303 + 308. *Craig B. Foltz, Ray J. Weymann, Simon L. Morris, and David A. Turnshek*. **317**, 450, 68-G10 (1987)
- Spectrophotometry of Six Broad Absorption Line QSOs. *Vesa T. Junkkarinen, E. Margaret Burbidge, and Harding E. Smith*. **317**, 460, 69-A7 (1987)
- The Distribution of Gas and Galaxies around the Distant Quasar PKS 1614 + 051. *Esther M. Hu and Lennox L. Cowie*. **317**, L7, 71-A9 (1987)
- Spatial Stability of Relativistic Jets: Application to 3C 345. *Philip E. Hardee*. **318**, 78, 79-F12 (1987)
- The Origin of the Diffuse X-Ray Background. *T. T. Hamilton and D. J. Helfand*. **318**, 93, 80-A1 (1987)
- Luminosity Dependence in the Ratio of X-Ray to Infrared Emission of QSOs. *D. M. Worrall*. **318**, 188, 81-A4 (1987)
- Extraction of Cosmological Information from Multiimage Gravitational Lenses. *Israel Kover*. **318**, L1, 85-A4 (1987)
- A New Upper Limit on the Density of Generally Distributed Intergalactic Neutral Hydrogen. *Charles C. Steidel and Wallace L. W. Sargent*. **318**, L11, 85-A13 (1987)
- Were the Lyman- α Clouds Formed from Shocks? *Ethan T. Vishniac and Gary S. Burt*. **319**, 14, 93-B7 (1987)
- Surveys of Fields around Quasars. IV. Luminosity of Galaxies at $z \geq 0.6$ and Preliminary Evidence for the Evolution of the Environment of Radio-loud Quasars. *H. K. C. Yee and Richard F. Green*. **319**, 28, 93-C12 (1987)
- 18 Centimeter VLBI Observations of the Quasar NRAO 140 during and after a Low-Frequency Outburst. *Alan P. Marscher, John J. Broderick, Lucia Padrielli, Norbert Bartel, and Jonathan D. Romney*. **319**, 456, 98-B8 (1987)
- Discovery of Low-Redshift, Neutral Hydrogen Absorption in the Radio Spectrum of PKS 2020 - 370. *C. L. Carilli and J. H. van Gorkom*. **319**, 683, 102-D8 (1987)
- The Galaxy-Quasar Connection: NGC 4319 and Markarian 205. I. Direct Imagery. *Jack W. Sulentic and Halton Arp*. **319**, 687, 102-D12 (1987)
- The Galaxy-Quasar Connection: NGC 4319 and Markarian 205. II. Spectroscopy. *Jack W. Sulentic and Halton Arp*. **319**, 693, 102-E10 (1987)
- High-Redshift QSO Absorbing Clouds and the Background Ionizing Source. *R. F. Carswell, J. K. Webb, J. A. Baldwin, and B. Atwood*. **319**, 709, 102-F13 (1987)
- Observations of Ni II Absorption at $z = 2.811$ toward the QSO PKS 0582 - 250. *David M. Meyer and Donald G. York*. **319**, L45, 107-B13 (1987)
- Multi-frequency VLBI Observations of 4C 39.25: A Superluminal Source without a Well-defined Core. *Alan P. Marscher, David B. Shafer, Roy S. Booth, and Barry J. Geldzahler*. **319**, L69, 107-D7 (1987)
- The Velocity Distribution of Quasar/AGN Broad Emission Line Clouds. *R. C. Puetter and E. N. Hubbard*. **320**, 85, 109-A6 (1987)
- What Is the Difference between Radio Galaxies and Radio Quasar Galaxies? *J. B. Hutchings*. **320**, 122, 109-D1 (1987)
- Hot Dust and the Near-Infrared Bump in the Continuum Spectra of Quasars and Active Galactic Nuclei. *Richard Barvainis*. **320**, 537, 115-D4 (1987)
- A Nonthermal Model for the XUV, Soft X-Ray Emission of AGN and QSOs. *T. W. Jones and W. A. Stein*. **320**, L1, 114-A4 (1987)
- $z_{\text{abs}} \sim z_{\text{em}}$ Absorption Systems in Quasar Spectra: A Correlation with Radio and Optical Luminosity? *Palle Møller and Peter Jakobsen*. **320**, L75, 121-A9 (1987)
- The Distribution of QSO Absorption System Column Densities: Evidence for a Single Population. *David Tytler*. **321**, 49, 122-F6 (1987)
- The Redshift Distribution of QSO Lyman-Alpha Absorption Systems. *David Tytler*. **321**, 69, 122-G12 (1987)
- On Nonthermal Models for Active Galactic Nuclei. *David L. Band*. **321**, 80, 123-A9 (1987)
- 6 Centimeter Radio Source Counts and Spectral Index Studies Down to 0.1 Millijansky. *R. Hank Donnelly, R. Bruce Partridge, and Rogier A. Windhorst*. **321**, 94, 123-B9 (1987)
- Broad-Band Properties of the Cfa Seyfert Galaxies. II. Infrared to Millimeter Properties. *R. A. Edelson, M. A. Malkan, and G. H. Rieke*. **321**, 233, 124-G1 (1987)
- Constraints on Quasar Accretion Disks from the Optical/Ultraviolet/Soft X-Ray Big Bump. *Bożena Czerny and Martin Elvis*. **321**, 305, 125-E5 (1987)
- Gravitational Imaging by Isolated Elliptical Potential Wells. II. Probability Distributions. *Christopher S. Kochanek and Roger D. Blandford*. **321**, 676, 132-A3 (1987)
- The Marginal Gravitational Lensing. *Israel Kover*. **321**, 686, 132-A13 (1987)
- Molecule Formation in Quasar Broad-Line Cloud Gas. *T. Kallman, S. Lepp, and P. Giovannoni*. **321**, 907, 134-D13 (1987)
- PC 0910 + 5625: An Optically Selected Quasar with a Redshift of 4.04. *Maarten Schmidt, Donald P. Schneider, and James E. Gunn*. **321**, L7, 129-B10 (1987)
- Superluminal Motion in the Double-lobed Quasar 3C 245. *D. H. Hough and A. C. S. Readhead*. **321**, L11, 129-C1 (1987)
- Discovery of a Probable Binary Quasar. *S. Djorgovski, R. Perley, G. Meylan, and P. McCarthy*. **321**, L17, 129-C6 (1987)
- Is Optical Fe II Emission Related to the Soft X-Ray Properties of Quasars? *Belinda J. Wilkes, Martin Elvis, and Ian McHardy*. **321**, L23, 129-C12 (1987)
- Cosmological H II Regions and the Photoionization of the Intergalactic Medium. *Paul R. Shapiro and Mark L. Giroux*. **321**, L107, 137-A13 (1987)
- Absorption in the Wide QSO Pair Tololo 1037 - 2704 and Tololo 1038 - 2712: Evidence for a Specially Aligned Supercluster at $z = 2$? *Wallace L. W. Sargent and Charles C. Steidel*. **322**, 142, 139-D11 (1987)
- Emission-Line Variability and the Broad-Line Region of Quasi-stellar Objects. I. Time Scales and Photon Densities. *Wei Zheng, E. Margaret Burbidge, Harding E. Smith, Ross D. Cohen, and Steven E. Bradley*. **322**, 164, 139-F5 (1987)
- New Considerations on the Broad-Line Regions of Quasars. *J. H. You and F. H. Cheng*. **322**, 174, 139-G2 (1987)
- The Effect of a Quasi-stellar Object on Its Host Galaxy: Dynamical and Physical Processes in the Interstellar Medium around a Quasi-stellar Object. *C. A. Chang, A. V. R. Schiano, and A. M. Wolfe*. **322**, 180, 139-G8 (1987)
- PG 1411 + 442: The Nearest Broad Absorption Line Quasar. *Matthew A. Malkan, Richard F. Green, and John B. Hutchings*. **322**, 729, 147-G6 (1987)
- An Absorption-Line Survey of 32 QSOs at Red Wavelengths: Properties of the Mg II Absorbers. *Kenneth M. Lanzetta, David A. Turnshek, and Arthur M. Wolfe*. **322**, 739, 148-A2 (1987)
- Constraints on Possible Precursor AGN Sources of the Cosmic X-Ray Background. *Elihu Boldt and Darryl Leiter*. **322**, L1, 145-A4 (1987)
- A Search for QSOs to Fit a Cosmological Model with Flat, Closed Spatial Sections. *H. V. Fagundes and U. F. Wichoski*. **322**, L5, 145-A8 (1987)
- Quasar Energy Distributions. I. Soft X-Ray Spectra of Quasars. *Belinda J. Wilkes and Martin Elvis*. **323**, 243, 155-F5 (1987)
- The Remarkable Broad Absorption Line QSO 0059 - 2735 with Extensive Fe II Absorption. *C. Hazard, Richard G. McMahon, John K. Webb, and Donald C. Morton*. **323**, 263, 156-A1 (1987)
- Can Quasars Ionize the Intergalactic Medium? *Megan Donahue and J. Michael Shull*. **323**, L13, 158-B1 (1987)
- Forbidden [O II] and [O III] Emission 29'' from a QSO Absorption-Line Region. *Brian Yanny, Don Hamilton, R. A. Schommer, T. B. Williams, and D. G. York*. **323**, L19, 158-B7 (1987)
- Extraction of Cosmological Information from Multiimage Gravitational Lenses: Erratum. *Israel Kover*. **323**, L155, 164-E13 (1987) (Orig. paper in **318**, L1, 85-A4)
- A New Optical Catalog of Quasi-stellar Objects. *A. Hewitt and G.*

- Burbidge*. **63**, 1, 1-A5 (1987) (Abstr. in **311**, 1076, 160-E12)
- Continuum Energy Distributions of Quasars in the Palomar-Green Survey. *G. Neugebauer, R. F. Green, K. Matthews, M. Schmidt, B. T. Soifer, and J. Bennett*. **63**, 615, 10-A7 (1987) (Abstr. in **313**, 929, 26-G12)
- Optical and Near-Infrared Observations of BL Lacertae Objects and Active Quasars. *Paul S. Smith, Thomas J. Balonek, Richard Elston, and Paul A. Heckert*. **64**, 459, 22-G9 (1987) (Abstr. in **316**, 860, 61-E2)
- High-Resolution Spectra of 24 Low-Redshift QSOs: The Properties of Mg II Absorption Systems. *David Tytler, A. Boksenberg, Wallace L. W. Sargent, Peter Young, and Daniel Kunth*. **64**, 667, 27-B8 (1987) (Abstr. in **318**, 945, 91-C10)
- The Accuracy of Cross-Correlation Estimates of Quasar Emission-Line Region Sizes. *C. Martin Gaskell and Bradley M. Peterson*. **65**, 1, 28-A5 (1987) (Abstr. in **319**, 1011, 106-A9)
- Daily Observations of Compact Extragalactic Radio Sources at 2695 and 8085 MHz, 1979-1985. *R. L. Fiedler, E. B. Waltman, J. H. Spencer, K. J. Johnston, P. E. Angerhofer, D. R. Florkowski, F. J. Jostes, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. **65**, 319, 33-A5 (1987) (Abstr. in **321**, 1050, 136-A1)
- Radar Astronomy**
- Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of *Voyager 2*. *John D. Anderson, Timothy P. Krisher, Susan E. Borutzki, Michael J. Connally, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen*. **323**, L141, 164-E1 (1987)
- Radial Velocities**
- On the Apparent Velocity of Integrated Sunlight. I. 1983-1985. *Drake Deming, Fred Espenak, Donald E. Jennings, James W. Brault, and Jeremy Wagner*. **316**, 771, 60-E4 (1987)
- Radial Velocities of Late-Type Stars in the Galactic Center. *K. Seligren, D. N. B. Hall, S. G. Kleinmann, and N. Z. Scoville*. **317**, 881, 75-F5 (1987)
- Kinematics and Age of the Low-Mass X-Ray Binaries. *A. P. Cowley, J. B. Hutchings, David Crampton, and F. D. A. Hartwick*. **320**, 296, 111-C11 (1987)
- Observational Studies of Cepheids. V. Radial Velocities of Bright Cepheids. *Thomas G. Barnes III, Thomas J. Moffett, and Mark H. Slovak*. **65**, 307, 32-E1 (1987) (Abstr. in **320**, 937, 120-B2)
- Radial Velocities in Selected B-G Stars. *Priscilla C. Frisch*. **65**, 313, 32-E9 (1987) (Abstr. in **320**, 937, 120-B2)
- Radiation Mechanisms**
- X-Rays from the Radio Halo of M87. *E. D. Feigelson, P. A. D. Wood, E. J. Schreier, D. E. Harris, and M. J. Reid*. **312**, 101, 2-B5 (1987)
- A Statistical Analysis of the Einstein Normal Galaxy Sample. III. Radio and X-Ray Properties of Elliptical and S0 Galaxies. *G. Fabbiano, U. Klein, G. Trinchieri, and R. Wielebinski*. **312**, 111, 2-C1 (1987)
- Persistent Emission and Bursts from Aquila X-1 Observed by Einstein. *M. Czerny, B. Czerny, and J. E. Grindlay*. **312**, 122, 2-C13 (1987)
- Centaurus A Observation at MeV- Gamma-Ray Energies. *P. von Ballmoos, R. Diehl, and V. Schönfelder*. **312**, 134, 2-D11 (1987)
- Anisotropic Radiation Fields Produced by Scattering in Thick Accretion Disks. *J. Madej, C. Loken, and R. N. Henriksen*. **312**, 652, 10-A13 (1987)
- X-Ray Background, Discrete Sources, and Diffuse Processes. *Riccardo Giacconi and Giovanna Zamorani*. **313**, 20, 15-B12 (1987)
- X-Ray Emission Associated with the Jet in 3C 273. *D. E. Harris and C. P. Stern*. **313**, 136, 16-D14 (1987)
- The Origin of the Photoionizing Continuum of Active Galactic Nuclei and Quasars. *S. L. O'Dell, H. A. Scott, and W. A. Stein*. **313**, 164, 16-F14 (1987)
- Synchrotron Emission and Gamma-Ray Bursts. *J. J. Brainerd and D. Q. Lamb*. **313**, 231, 17-D14 (1987)
- Radio Emission from FK Comae. *V. A. Hughes and B. J. McLean*. **313**, 263, 17-G5 (1987)
- Simultaneous Multifrequency Observations of the BL Lacertae Object Markarian 421. *F. Makino, Y. Tanaka, M. Matsuoka, K. Koyama, H. Inoue, K. Makishima, R. Hoshi, S. Hayakawa, Y. Kondo, C. M. Urry, S. L. Mufson, K. R. Hackney, L. R. Hackney, S. Kikuchi, Y. Mikami, W. Z. Wisniewski, N. Hiromoto, M. Nishida, J. Burnell, P. Brand, P. M. Williams, M. G. Smith, F. Takahara, M. Inoue, M. Tsuboi, H. Tabara, T. Kato, M. F. Aller, and H. D. Aller*. **313**, 662, 24-A12 (1987)
- The X-Ray Emission from Gamma-Ray Burst Sources: Constraints on Theoretical Models. *James N. Imamura and Richard I. Epstein*. **313**, 711, 24-E6 (1987)
- A Bright Optical Synchrotron Counterpart of the Western Hot Spot in Pictor A. *Hermann-Josef Rösser and Klaus Meisenheimer*. **314**, 70, 28-G1 (1987)
- Electromagnetic Cascades in the Magnetosphere of a Very Young Pulsar: A Model for the Positron Production near the Galactic Center. *Apostolos Mastichiadis, Kenneth Brecher, and Alan P. Marscher*. **314**, 88, 29-A5 (1987)
- Radiation from Relativistic Beams Interacting with Interstellar Gas. *W. K. Rose, J. H. Beall, J. Guillory, and S. Kainer*. **314**, 95, 29-A12 (1987)
- On the Origin of the 40-120 Micron Emission of Galaxy Disks: A Comparison with H α Fluxes. *Carol J. Lonsdale Persson and George Helou*. **314**, 513, 35-B8 (1987)
- X-Ray Spectra of PG Quasars. II. The X-Ray-Ultraviolet Excess of PG 1211 + 143. *Jill Bechtold, Bozena Czerny, Martin Elvis, G. Fabbiano, and Richard F. Green*. **314**, 699, 37-C5 (1987)
- The Continuum of Type I Seyfert Galaxies. I. A Single Form Modified by the Effects of Dust. *Martin Ward, Martin Elvis, G. Fabbiano, N. P. Carleton, S. P. Willner, and A. Lawrence*. **315**, 74, 40-F12 (1987)
- Physical Processes and Infrared Emission from the Cassiopeia A Supernova Remnant. *E. Dwek, H. L. Dinerstein, F. C. Gillett, M. G. Hauser, and W. L. Rice*. **315**, 571, 47-A1 (1987)
- Effects of Electron-Positron Pair Opacity for Spherical Accretion onto Black Holes. *Alan P. Lightman, Andrzej A. Zdziarski, and Martin J. Rees*. **315**, L113, 49-D8 (1987)
- SiO Cooling Instability in the Envelopes of Cool Giant Stars. *David O. Muchmore, Joseph A. Nuth III, and Robert E. Stencel*. **315**, L141, 49-F10 (1987)
- Neutrino-Pair Bremsstrahlung in Dense Stars. V. Partially Degenerate Electrons. *Hiroharu Munakata, Yasuharu Kohyama, and Naoki Itoh*. **316**, 708, 59-G3 (1987)
- A Radio Survey of Symbiotic Stars: Erratum. *E. R. Seaquist, A. R. Taylor, and S. Sutton*. **317**, 555, 70-A5 (1987) (Orig. paper in **284**, 202, 100-C7)
- Nonlinear Radiative Condensation in a Sheared Magnetic Field. *G. Van Hoven, L. Sparks, and D. D. Schnack*. **317**, L91, 78-D9 (1987)
- Simultaneous Multifrequency Observations of Markarian 421. *Jean Brodie, Stuart Bowyer, and Allyn Tennant*. **318**, 175, 80-G5 (1987)
- Luminosity Dependence in the Ratio of X-Ray to Infrared Emission of QSOs. *D. M. Worrall*. **318**, 188, 81-A4 (1987)
- A Radiative Bow Shock Wave (?) Driven by Nuclear Ejecta in a Seyfert Galaxy. *Andrew S. Wilson and James S. Ulvestad*. **319**, 105, 94-B11 (1987)
- IRAS Observations of Collisionally Heated Dust in Large Magellanic Cloud Supernova Remnants. *James R. Graham, A. Evans, J. S. Albinson, M. F. Bode, and W. P. S. Meikle*. **319**, 126, 94-D5 (1987)
- Observation of Nonthermal Energy Distributions during the Impulsive Phase of Solar Flares. *J. F. Seely, U. Feldman, and G. A. Doschek*. **319**, 541, 99-B9 (1987)
- Pair Production and Compton Scattering in Compact Sources and Comparison to Observations of Active Galactic Nuclei. *Alan P. Lightman and Andrzej A. Zdziarski*. **319**, 643, 102-A7 (1987)
- Gamma-Ray Pulsar Model. *Jeffrey M. Cohen and Errol Mustafa*. **319**, 930, 105-B5 (1987)
- Quantized Synchrotron Radiation in Strong Magnetic Fields. *Alice K. Harding and Robert Preece*. **319**, 939, 105-C1 (1987)
- IRAS Observations of Supernova Remnants: A Comparison between Their Infrared and X-Ray Cooling Rates. *Eli Dwek, Robert Petre, Andrew Szymkowiak, and Walter L. Rice*. **320**, 27, 114-C4 (1987)
- The Einstein View of the Wolf-Rayet Stars. *A. M. T. Pollock*. **320**, 283, 111-B12 (1987)
- Hot Dust and the Near-Infrared Bump in the Continuum Spectra of Quasars and Active Galactic Nuclei. *Richard Barvainis*. **320**, 537, 115-D4 (1987)
- Analytic and Numerical Calculations of Quantum Synchrotron Spectra from Relativistic Electron Distributions. *J. J. Brainerd and V. Petrosian*. **320**, 703, 117-D11 (1987)
- Quantum Synchrotron Spectra from Semirelativistic Electrons in Teragauss Magnetic Fields. *J. J. Brainerd*. **320**, 714, 117-E8 (1987)
- Polarized Radiation from Extended Magnetic Polar Caps. *G. Channugam and J. Frank*. **320**, 746, 118-A1 (1987)
- A Nonthermal Model for the XUV, Soft X-Ray Emission of AGN and QSOs. *T. W. Jones and W. A. Stein*. **320**, L1, 114-A4 (1987)
- Electron Injection by Relativistic Protons in Active Galactic Nuclei. *Marek Sikora, John G. Kirk, Mitchell C. Begelman, and Peter Schneider*. **320**, L81, 121-B1 (1987)
- On Nonthermal Models for Active Galactic Nuclei. *David L. Band*. **321**, 80, 123-A9 (1987)

Radiation Mechanisms—Continued

- Relativistic Thermal Plasmas: Time Development of Electron-Positron Pair Concentration. *Masaaki Kusunose*. **321**, 186, 124-C3 (1987)
- The Collapse of Dense Star Clusters to Supermassive Black Holes: Binaries and Gravitational Radiation. *Gerald D. Quinlan and Stuart L. Shapiro*. **321**, 199, 124-D2 (1987)
- Broad-Band Properties of the CFA Seyfert Galaxies. II. Infrared to Millimeter Properties. *R. A. Edelson, M. A. Malkan, and G. H. Rieke*. **321**, 233, 124-G1 (1987)
- Optical and X-Ray Radiation from Fast Pulsars: Effects of Duty Cycle and Spectral Shape. *F. Pacini and M. Salvati*. **321**, 447, 127-A12 (1987)
- Simultaneous 2 and 6 Centimeter Wavelength Observations of a Solar Flare Using the VLA. *M. R. Kundu, T. Velusamy, and S. M. White*. **321**, 593, 128-E9 (1987)
- Electromagnetic Jets from Compact Objects. *F. Curtis Michel*. **321**, 714, 132-C13 (1987)
- Generation of Plasma Waves by Thick-Target Electron Beams and the Expected Radiation Signature. *Russell J. Hamilton and Vahé Petrosian*. **321**, 721, 132-D6 (1987)
- New Considerations on the Broad-Line Regions of Quasars. *J. H. You and F. H. Cheng*. **322**, 174, 139-G2 (1987)
- The Effect of a Quasi-stellar Object on Its Host Galaxy: Dynamical and Physical Processes in the Interstellar Medium around a Quasi-stellar Object. *C. A. Chang, A. V. R. Schiano, and A. M. Wolfe*. **322**, 180, 139-G8 (1987)
- Axion Bremsstrahlung in Dense Stars. *Masayuki Nakagawa, Yasuharu Kohyama, and Naoki Itoh*. **322**, 291, 141-A9 (1987)
- X-Ray Irradiated Accretion Disks and Bimodal States. *H. Inoue and R. Hoshi*. **322**, 320, 141-C11 (1987)
- Search for X-Ray Emission from the Radio Lobes of Scorpius X-1. *Barry Geldzahler and Paul Hertz*. **322**, 342, 141-E5 (1987)
- Evolution of the Axial Electron Cyclotron Maser Instability, with Applications to Solar Microwave Spikes. *Loukas Vlahos and Phillip Sprangle*. **322**, 463, 143-A10 (1987)
- Neutrino-Pair Bremsstrahlung in Dense Stars. IV. Phonon Contributions in the Crystalline Lattice Phase: Erratum. *Naoki Itoh, Yasuharu Kohyama, Noriyoshi Matsumoto, and Midori Seki*. **322**, 584, 144-C9 (1987) (Orig. paper in **285**, 304, 113-C2)
- Synchrotron Emission from Shock Waves in Active Galactic Nuclei. *P. L. Biermann and P. A. Strittmatter*. **322**, 643, 146-G5 (1987)
- Inverse Compton Scattering of Ambient Radiation by a Cold Relativistic Jet: A Source of Beamed, Polarized Continuum in Blazars? *Mitchell C. Begelman and Marek Sikora*. **322**, 650, 146-G12 (1987)
- X-Ray and Optical Observations of X-Ray-Selected BL Lacertae Objects. *P. Giommi, P. Barr, B. Garilli, I. M. Gioia, T. Maccacaro, D. Maccagni, and R. E. Schild*. **322**, 662, 146-A10 (1987)
- The Infrared Diagnostic of a Dusty Plasma with Applications to Supernova Remnants. *Eli Dwek*. **322**, 812, 148-F6 (1987)
- A Pulsar Emission Model: Observational Tests. *F. Curtis Michel*. **322**, 822, 148-G2 (1987)
- The Discovery of Nonthermal Radio Emission from Magnetic Bp-Ap Stars. *Stephen A. Drake, David C. Abbott, T. S. Bastian, J. H. Bieging, E. Churchwell, G. Dulk, and Jeffrey L. Linsky*. **322**, 902, 149-F10 (1987)
- Simultaneous SMM Flat Crystal Spectrometer and Very Large Array Observations of Solar Active Regions. *Kenneth R. Lang, Robert F. Willson, Kermit L. Smith, and Keith T. Strong*. **322**, 1035, 151-C4 (1987)
- Solar Active Region Physical Parameters Inferred from a Thermal Cyclotron Line and Soft X-Ray Spectral Lines. *Kenneth R. Lang, Robert F. Willson, Kermit L. Smith, and Keith T. Strong*. **322**, 1044, 151-D3 (1987)
- The Ionization Effects of Shock Breakout in SN 1987A. *M. A. Dopita, S. J. Meatheringham, P. Nulsen, and P. R. Wood*. **322**, L85, 152-C5 (1987)
- Degenerate Dwarf Binaries as Promising, Detectable Sources of Gravitational Radiation. *Charles R. Evans, Icko Iben, Jr., and Larry Smarr*. **323**, 129, 154-E1 (1987)
- On the Controversy Concerning Turbulent Bremsstrahlung. *D. B. Melrose and J. Kuijpers*. **323**, 338, 156-F7 (1987)
- Proton-Electron Bremsstrahlung Polarization: Solar Flare X-Ray and Gamma-Ray Polarization. *D. Heristich*. **323**, 391, 157-D2 (1987)
- Cerenkov Damping of Surface Waves. *Altair S. Assis and J. Busnardo-Neto*. **323**, 399, 157-D10 (1987)
- Pair-Creation Effects in Accretion Shock Models of Active Galactic Nuclei. *John M. Blondin and Arieh Königl*. **323**, 451, 159-E1 (1987)
- What Heats the Hot Phase in Active Nuclei? *William G. Mathews and Gary J. Ferland*. **323**, 456, 159-E6 (1987)
- Positron Annihilation at the Galactic Center. *B. J. Carrigan and J. I. Katz*. **323**, 557, 160-G23 (1987)
- The Properties of Bursts with Short Recurrence Times from the Transient X-Ray Source EXO 0748 - 676. *M. Gottwald, F. Haberl, A. N. Parmar, and N. E. White*. **323**, 575, 161-A11 (1987)
- Radiative Transfer**
- Mass Loss from FU Orionis Objects. *Ken Crowell, L. Hartmann, and E. H. Avrett*. **312**, 227, 3-D6 (1987)
- Anisotropic Radiation Fields Produced by Scattering in Thick Accretion Disks. *J. Madej, C. Loken, and R. N. Henriksen*. **312**, 652, 10-A13 (1987)
- Observations of Globules and Dark Clouds in the CO $J = 3-2$ and $J = 2-1$ Lines. *L. W. Avery, Glenn J. White, I. P. Williams, and N. Cronin*. **312**, 848, 12-B13 (1987)
- Smearing of a Beaming Pattern by an Isotropic Cloud: An Analysis with Applications to Nonpulsing X-Ray Sources and Cosmic Rays. *Y.-M. Wang and R. Schlickeiser*. **313**, 200, 17-B11 (1987)
- The "SEI" Method for Accurate and Efficient Calculations of Line Profiles in Spherically Symmetric Stellar Winds. *H. J. G. L. M. Lamers, M. Cerruti-Sola, and M. Perinotto*. **314**, 726, 37-E6 (1987)
- On the Line Emission Profile and Line Source Function in the Case of Partial Redistribution. *R. Freire Ferrero*. **314**, 822, 38-E8 (1987)
- Neutrino Annihilation in Type II Supernovae. *Jeremy Goodman, Arnon Dar, and Shmuel Nussinov*. **314**, L7, 33-B9 (1987)
- Time-dependent Calculations of X-Ray and γ Reprocessing. *Lynn R. Cominsky, Richard A. London, and Richard I. Klein*. **315**, 162, 41-F14 (1987)
- Neutrino Flows in Collapsing Stars: A Two-Fluid Model: Erratum. *J. Cooperstein, L. J. van den Horn, and E. A. Baron*. **315**, 729, 48-E10 (1987) (Orig. paper in **309**, 653, 128-D5)
- Radiative Bow Shock Models of Herbig-Haro Objects. *Patrick Hartigan, John Raymond, and Lee Hartmann*. **316**, 323, 53-D14 (1987)
- Thermal Emission from Bok Globules. *Man Hoi Lee and C. Rogers*. **317**, 197, 66-B8 (1987)
- An Instability of Radiative Acceleration. *J. I. Katz*. **317**, 264, 66-G3 (1987)
- Aberration and Advection Effects in a Plane-parallel Medium in Motion. *A. Peraiah*. **317**, 271, 66-G10 (1987)
- Resonant Raman-Cyclotron Scattering in Very Strong Magnetic Fields. *Edouard Miska and Dominique Miska*. **317**, 282, 67-A7 (1987)
- Polarization of Light Scattered from the Winds of Early-Type Stars. *J. P. Cassinelli, K. H. Nordieck, and M. A. Murison*. **317**, 290, 67-B1 (1987)
- Heating of the Solar Corona by the Resonant Absorption of Alfvén Waves. *Joseph M. Davila*. **317**, 514, 69-E4 (1987)
- Cylindrical Astrophysical Maser Models: Polarization Due to Magnetic Fields. *L. R. Western*. **317**, 858, 75-D7 (1987)
- Effect of an Electron Scattering Cloud on X-Ray Oscillations Produced by Beaming. *J. Brainerd and F. K. Lamb*. **317**, L33, 71-C6 (1987)
- Stokes Profile Analysis and Vector Magnetic Fields. III. Extended Temperature Minima of Sunspot Umbrae as Inferred from Stokes Profiles of Mg I $\lambda 4571$. *B. W. Lites, A. Skumanich, D. E. Rees, G. A. Murphy, and M. Carlsson*. **318**, 930, 91-B6 (1987)
- Quantized Synchrotron Radiation in Strong Magnetic Fields. *Alice K. Harding and Robert Preece*. **319**, 939, 105-C1 (1987)
- Radiogenic Heating of Comets by ^{26}Al and Implications for Their Time of Formation. *Dina Prialnik, Akiva Bar-Nun, and Morris Podolak*. **319**, 993, 105-G1 (1987)
- The Poynting-Robertson Effect of a Rotating Star. *Edwin T. Rusk*. **320**, 315, 111-E2 (1987)
- LTE Modeling of Inhomogeneous Chromospheric Structure Using High-Resolution Limb Observation. *C. Lindsey*. **320**, 893, 119-E9 (1987)
- A Solar Chromosphere and Spicule Model Based on Far-Infrared Limb Observations. *D. Braun and C. Lindsey*. **320**, 898, 119-E11 (1987)
- Are the High-Velocity Molecular Flows Really Clumpy? *J. Cantó, L. F. Rodríguez, and G. Anglada*. **321**, 877, 134-B11 (1987)
- The Scattering of Alfvén Waves by Density Fluctuations. *He-Sheng Li and Ellen G. Zweibel*. **322**, 248, 140-E8 (1987)
- Carbon Grains in the Envelope of IRC +10216. *P. G. Martin and C. Rogers*. **322**, 374, 142-A1 (1987)
- Stokes Profile Analysis and Vector Magnetic Fields. I. Inversion of Photospheric Lines. *A. Skumanich and B. W. Lites*. **322**, 473, 143-B8 (1987)
- Partial Redistribution in High-Density, Highly Ionized Plasmas. *B. Talin, R. Stamm, V. P. Kafandjian, and Lewis Klein*. **322**, 804, 148-E12 (1987)
- Spectral Flux from Low-Density Photospheres: Low-Temperature Results. *Stephen Herschkowitz and Robert V. Wagoner*. **322**, 967, 150-D11 (1987)
- The Thermodynamics of Anisotropic Radiating Systems. *Albert Fu*. **323**, 211, 155-D1 (1987)
- Physical Constraints on Variable Eddington Factors for the Gray

- Problem in Radiative Transfer. *Albert Fu*. **323**, 227, 155-E3 (1987)
- Effects of Electron Scattering on the Oscillations of an X-Ray Source. *Nikolaos D. Kylafis and George S. Klimis*. **323**, 678, 162-B8 (1987)
- Mass Loss from Evolved Stars. VII. OH Maser Shell Radii and Mass-Loss Rates for OH/IR Stars. *Nathan Netzer and G. R. Knapp*. **323**, 734, 162-F12 (1987)
- Radio Sources: Extended**
- 1928 + 738: A Superluminal Source with Large-Scale Structure. *K. J. Johnston, R. S. Simon, A. Eckart, P. Biermann, C. Schalinski, A. Witzel, and R. G. Strom*. **313**, L85, 27-D11 (1987)
- High-Resolution Radio Observations of the Supernova Remnant G24.7 + 0.6 and the Discovery of an Ultracompact H II Region. *R. H. Becker and D. J. Helfand*. **316**, 660, 59-C10 (1987)
- Superluminal Motion in the Double-lobed Quasar 3C 245. *D. H. Hough and A. C. S. Readhead*. **321**, L11, 129-C1 (1987)
- The Linear Filaments of the Radio Arc near the Galactic Center. *Farhad Yusef-Zadeh and Mark Morris*. **322**, 721, 147-F7 (1987)
- A Palomar Observatory Sky Survey Atlas of Selected Molecular Clouds. *D. A. Klingensmith and J. M. Hollis*. **64**, 127, 18-F5 (1987) (Abstr. in **315**, 731, 48-E12)
- Radio Sources: Galaxies**
- A Statistical Analysis of the Einstein Normal Galaxy Sample. III. Radio and X-Ray Properties of Elliptical and S0 Galaxies. *G. Fabbiano, U. Klein, G. Trinchieri, and R. Wielebinski*. **312**, 111, 2-C1 (1987)
- Imaging Spectroscopy of Five QSOs. *Paul Hickson and J. B. Hutchings*. **312**, 518, 8-E6 (1987)
- The Peculiar Galaxy IC 4553. II. VLA Observations of the Neutral Hydrogen. *Willem A. Baan, J. H. van Gorkom, Joan T. Schmelz, and I. Felix Mirabel*. **313**, 102, 16-B7 (1987)
- Beam Models for Radio Sources. VI. Evolution of Magnetized Jets in Power-Law Potentials. *M. Javad Siah and Paul J. Wiita*. **313**, 623, 23-E8 (1987)
- Broad-Band Properties of the Cfa Seyfert Galaxies. I. Radio Properties. *R. A. Edelson*. **313**, 651, 24-A1 (1987)
- Simultaneous Multifrequency Observations of the BL Lacertine Object Markarian 421. *F. Makino, Y. Tanaka, M. Matsuoka, K. Koyama, H. Inoue, K. Makishima, R. Hoshi, S. Hayakawa, Y. Kondo, C. M. Urry, S. L. Mufson, K. R. Hackney, L. R. Hackney, S. Kikuchi, Y. Mikami, W. Z. Wisniewski, N. Hiromoto, M. Nishida, J. Burnell, P. Brand, P. M. Williams, M. G. Smith, F. Takahara, M. Inoue, M. Tsuboi, H. Tabara, T. Kato, M. F. Aller, and H. D. Aller*. **313**, 662, 24-A12 (1987)
- An Unusual Radio Loop in the Edge-on Seyfert Galaxy NGC 5506. *Ann E. Wehrle and Mark Morris*. **313**, L43, 27-B1 (1987)
- The H I Distribution and Kinematics in Four Low-Luminosity Elliptical Galaxies. *George Lake, R. A. Schommer, and J. H. van Gorkom*. **314**, 57, 28-E12 (1987)
- A Bright Optical Synchrotron Counterpart of the Western Hot Spot in Pictor A. *Hermann-Josef Rösser and Klaus Meisenheimer*. **314**, 70, 28-G1 (1987)
- H I Maps of S0 Galaxies with Polar Rings. *J. H. van Gorkom, Paul L. Schechter, and Jerome Kristian*. **314**, 457, 34-E3 (1987)
- Hydrostatic Confinement of Radio Jets. *Kayll Lake and Patrick Bouchet*. **314**, 507, 34-B2 (1987)
- The Relationship between Stellar Population and Radio Continuum Emission in Spiral Galaxies. *David Burstein, J. J. Condon, and Q. F. Yin*. **315**, L99, 49-C8 (1987)
- The Reddening of Cygnus A from a Measurement of Paschen-Alpha. *S. J. Lilly and G. J. Hill*. **315**, L103, 49-C12 (1987)
- Color Evolution in High-Redshift Galaxies. *Peter R. M. Eisenhardt and M. J. Lebofsky*. **316**, 70, 50-F14 (1987)
- Astrophysical Implications of the Multifrequency VLA Observations of NGC 1265. *Christopher P. O'Dea and Frazer N. Owen*. **316**, 95, 51-A11 (1987)
- Narrow-Angle Tail Radio Sources and the Distribution of Galaxy Orbits in Abell Clusters. *Christopher P. O'Dea, Craig L. Sarazin, and Frazer N. Owen*. **316**, 113, 51-C1 (1987)
- The Radio Morphology of 3C 120 on Scales from 0.5 Parsecs to 400 Kiloparsecs. *R. C. Walker, J. M. Benson, and S. C. Unwin*. **316**, 546, 58-A5 (1987)
- 92 Centimeter VLBI Structure of the Elliptical Galaxy MCG 5-4-18: Erratum. *J. M. Wrobel and R. S. Simon*. **316**, 858, 61-D14 (1987) (Orig. paper in **309**, 593, 127-F6)
- 1.4 GHz Continuum Sources in the Cancer Cluster. *E. E. Salpeter and J. M. Dickey*. **317**, 102, 65-B1 (1987)
- Preliminary VLA Limits on the Sunyaev-Zel'dovich Effect in Abell 2218. *R. B. Partridge, R. A. Perley, N. Mandolesi, and F. Delpino*. **317**, 112, 65-B11 (1987)
- VLBI Observations of the 3C 111 Jet. *Roger Linfield*. **317**, 121, 65-C7 (1987)
- Interpretation of Deep Counts of Radio Sources. *L. Danese, G. De Zotti, A. Franceschini, and L. Toffolatti*. **318**, L15, 85-B2 (1987)
- Giant H II Regions in M81. *Michele Kaufman, Frank N. Bash, R. C. Kennicutt, Jr., and P. W. Hodge*. **319**, 61, 93-F7 (1987)
- A Radiative Bow Shock Wave (?) Driven by Nuclear Ejecta in a Seyfert Galaxy. *Andrew S. Wilson and James S. Ulvestad*. **319**, 105, 94-B11 (1987)
- B2 0800 + 24: A Narrow-Angle Tail Radio Galaxy in a Small Group of Galaxies. *John T. Stocke and Jack O. Burns*. **319**, 671, 102-C8 (1987)
- Extended Lyman- α Emission in 3C 326.1: A 100 Kiloparsec Cloud of Ionized Gas at a Redshift of 1.82. *Patrick J. McCarthy, Hyron Spinrad, S. Djorgovski, Michael A. Strauss, Wil van Breugel, and James Liebert*. **319**, L39, 107-B2 (1987)
- A Shocked-Jet Model of the Galactic Center Bridge and the Radio Arc. *Yoshiaki Sofue and Mitsuaki Fujimoto*. **319**, L73, 107-D11 (1987)
- 21 Centimeter Study of Spiral Galaxies in the Coma Supercluster. *Giuseppe Gavazzi*. **320**, 96, 109-B3 (1987)
- What Is the Difference between Radio Galaxies and Radio Quasar Galaxies? *J. B. Hutchings*. **320**, 122, 109-D1 (1987)
- 6 Centimeter Radio Source Counts and Spectral Index Studies Down to 0.1 Millijanskys. *R. Hank Donnelly, R. Bruce Partridge, and Rogier A. Windhorst*. **321**, 94, 123-B9 (1987)
- Broad-Band Properties of the Cfa Seyfert Galaxies. II. Infrared to Millimeter Properties. *R. A. Edelson, M. A. Malkan, and G. H. Rieke*. **321**, 233, 124-G1 (1987)
- The Triple Radio Source 0023 + 171: A Candidate for a Dark Gravitational Lens. *J. N. Hewitt, E. L. Turner, C. R. Lawrence, D. P. Schneider, J. E. Gunn, C. L. Bennett, B. F. Burke, J. H. Mahoney, G. I. Langston, M. Schmidt, J. B. Oke, and J. G. Hoessel*. **321**, 706, 132-C5 (1987)
- A Correlation between the Radio and Optical Morphologies of Distant 3CR Radio Galaxies. *Patrick J. McCarthy, Wil van Breugel, Hyron Spinrad, and S. Djorgovski*. **321**, L29, 129-D3 (1987)
- Arecibo Observations of IRAS Galaxies at 21 and 18 Centimeters Wavelengths. *Robert W. Garwood, George Helou, and John M. Dickey*. **322**, 88, 138-G11 (1987)
- Near-Infrared Observations of Submillijansky Radio Sources: Evidence for a Population of Starburst Galaxies at Intermediate Redshifts. *Trinh X. Thuan and J. J. Condon*. **322**, L9, 145-A11 (1987)
- Linear Polarization Structure of the BL Lacertae Object OJ 287 at Milliarcsecond Resolution. *D. H. Roberts, D. C. Gabuzda, and J. F. C. Wardle*. **323**, 536, 160-E5 (1987)
- Neutral Hydrogen in Compact Groups of Galaxies. *B. A. Williams and Herbert J. Rood*. **63**, 265, 4-C8 (1987) (Abstr. in **312**, 964, 13-E5)
- H I Survey of Face-on Galaxies: The Frequency of Distortions in H I Disks. *B. M. Lewis*. **63**, 515, 9-A5 (1987) (Abstr. in **313**, 928, 26-G11)
- Radio Continuum Observations of Early- and Late-Type Spiral Galaxies. *Isabella M. Gioia and Giuseppina Fabbiano*. **63**, 771, 13-A13 (1987) (Abstr. in **314**, 831, 38-F7)
- A 1.49 GHz Atlas of Spiral Galaxies with $B_T \leq +12$ and $\delta \geq -45^\circ$. *J. J. Condon*. **65**, 485, 36-B1 (1987) (Abstr. in **322**, 1075, 151-G1)
- A 1.49 GHz Supplementary Atlas of Spiral Galaxies with H -Magnitudes. *J. J. Condon, Q. F. Yin, and David Burstein*. **65**, 543, 36-G1 (1987) (Abstr. in **322**, 1075, 151-G1)
- Radio Sources: General**
- Evidence for Refractive Scintillation of Two Extragalactic Sources Seen through the Galactic Disk. *Brian Dennison, R. Fiedler, K. J. Johnston, J. H. Spencer, E. B. Waltman, P. E. Angerhofer, D. R. Florkowski, F. J. Jostes, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. **313**, 141, 16-E5 (1987)
- Source Counts in the Chronometric Cosmology. *Edward L. Wright*. **313**, 551, 22-G1 (1987)
- X-Ray Studies of Quasars with the EINSTEIN OBSERVATORY. IV. X-Ray Dependence on Radio Emission. *D. M. Worrall, P. Giommi, H. Tananbaum, and G. Zamorani*. **313**, 596, 23-C9 (1987)
- Comet Halley: OH Absorption of Galactic Background Radio Sources. *E. Bajaja, E. M. Arnal, J. C. Cerosimo, F. R. Colomb, M. C. Martin, J. Mazzaro, R. Morris, J. C. Olalde, W. G. L. Poppel, A. M. Silva, I. F. Mirabel, and V. Boriakoff*. **313**, 906, 26-F2 (1987)
- 1928 + 738: A Superluminal Source with Large-Scale Structure. *K. J. Johnston, R. S. Simon, A. Eckart, P. Biermann, C. Schalinski, A. Witzel, and R. G. Strom*. **313**, L85, 27-D11 (1987)
- VLA Observations of the Fast Pulsar Candidate in M28. *W. C. Erickson, M. J. Mahoney, R. H. Becker, and D. J. Helfand*. **314**, L45, 39-B9 (1987)
- Electron Scintillation in Gravitationally Lensed Images of Astrophysical Radio Sources. *Shuji Deguchi and William D. Watson*. **315**, 440, 45-E4 (1987)
- Temperature and Emission-Measure Distributions for Several Planetary Nebulae. *J. P. Basart and C. T. Daub*. **317**, 412, 68-D14 (1987)

Radio Sources: General—Continued

- Correction of a Study of Source Counts in the Chronometric Cosmology. *I. E. Segal*. **320**, 135, 109-E1 (1987)
- Discovery of a Probable Binary Quasar. *S. Djorgovski, R. Perley, G. Meylan, and P. McCarthy*. **321**, L17, 129-C6 (1987)
- A Correlation between the Radio and Optical Morphologies of Distant 3CR Radio Galaxies. *Patrick J. McCarthy, Wil van Breugel, Hyron Spinrad, and S. Djorgovski*. **321**, L29, 129-D3 (1987)
- The Large-Scale Radio Structure of R Aquarii. *J. M. Hollis, M. Kafatos, A. G. Michalitsianos, R. J. Oliversen, and F. Yusef-Zadeh*. **321**, L55, 129-F6 (1987)
- Observation of the OH 1667 MHz Line toward Comet Halley from the Southern Hemisphere. *E. Bajaja, R. Morras, W. G. L. Pöppel, J. E. Cersosimo, M. C. Martin, J. Mazzaro, J. C. Olalde, A. Silva, E. M. Arnal, F. R. Colomb, I. F. Mirabel, and V. Boriakoff*. **322**, 549, 144-A1 (1987)

Radio Sources: Identifications

- 6 Centimeter Radio Source Counts and Spectral Index Studies Down to 0.1 Millijansky. *R. Hank Donnelly, R. Bruce Partridge, and Rogier A. Windhorst*. **321**, 94, 123-B9 (1987)
- Search for X-Ray Emission from the Radio Lobes of Scorpius X-1. *Barry Geldzahler and Paul Hertz*. **322**, 342, 141-E5 (1987)
- A Radio Search for Crab-like Nebulae in M33. *Stephen P. Reynolds and John D. Fix*. **322**, 673, 147-B7 (1987)
- The Discovery of Nonthermal Radio Emission from Magnetic Bp-Ap Stars. *Stephen A. Drake, David C. Abbott, T. S. Bastian, J. H. Bieging, E. Churchwell, G. Dulk, and Jeffrey L. Linsky*. **322**, 902, 149-F10 (1987)
- A New Optical Catalog of Quasi-stellar Objects. *A. Hewitt and G. Burbidge*. **63**, 1, 1-A5 (1987) (Abstr. in **311**, 1076, 160-E12)

Radio Sources: Lines

- The Circumstellar Envelope of W3(OH): NH₃ Observations. *Mark J. Reid, Philip C. Myers, and John H. Bieging*. **312**, 830, 12-A9 (1987)
- Sulfur, Carbon, Helium, and Hydrogen 125 α Observations and Physical Analysis of the W48 Neutral Interface. *J. P. Vallee*. **317**, 693, 73-E13 (1987)
- Detection of Intense Unidentified Lines in TMC-1. *Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito*. **317**, L111, 78-E14 (1987)
- Are the High-Velocity Molecular Flows Really Clumpy? *J. Cantó, L. F. Rodríguez, and G. Anglada*. **321**, 877, 134-B11 (1987)
- Radio Recombination Lines from Fast Shocks in Molecular Clouds, with Application to Bipolar Flows. *Christopher F. McKee and David J. Hollenbach*. **322**, 275, 140-G7 (1987)
- Measurements of the ³He Abundance in the Interstellar Medium. *T. M. Bania, Robert T. Rood, and T. L. Wilson*. **323**, 30, 153-D3 (1987)

Radio Sources: Spectra

- Source Counts in the Chronometric Cosmology. *Edward L. Wright*. **313**, 551, 22-G1 (1987)
- The Radio Luminosity Function of Optically Selected Quasars. *Herman L. Marshall*. **316**, 84, 50-G14 (1987)
- The Radio Spectrum of Cyclopentene. *J. M. Vrtilek, C. A. Gottlieb, T. J. LePage, and P. Thaddeus*. **316**, 826, 61-B4 (1987)
- 6 Centimeter Radio Source Counts and Spectral Index Studies Down to 0.1 Millijansky. *R. Hank Donnelly, R. Bruce Partridge, and Rogier A. Windhorst*. **321**, 94, 123-B9 (1987)
- The Large-Scale Radio Structure of R Aquarii. *J. M. Hollis, M. Kafatos, A. G. Michalitsianos, R. J. Oliversen, and F. Yusef-Zadeh*. **321**, L55, 129-F6 (1987)

Radio Sources: 21 cm Radiation

- The Peculiar Galaxy IC 4553. II. VLA Observations of the Neutral Hydrogen. *Willem A. Baan, J. H. van Gorkom, Joan T. Schmelz, and I. Felix Mirabel*. **313**, 102, 16-B7 (1987)
- Sources of Error in the Tully-Fisher Relation: Reducing the Scatter with CCD *i*-Band Surface Photometry of Spiral Galaxies. *Gregory D. Bothun and Jeremy R. Mould*. **313**, 629, 23-F1 (1987)
- Evidence for Ram Pressure Stripping of NGC 3073 by Outflowing Gas from NGC 3079. *Judith A. Irwin, E. R. Seaquist, A. R. Taylor, and N. Duric*. **313**, L91, 27-E3 (1987)
- The H I Distribution and Kinematics in Four Low-Luminosity Elliptical Galaxies. *George Lake, R. A. Schommer, and J. H. van Gorkom*. **314**, 57, 28-E12 (1987)
- H I Maps of S0 Galaxies with Polar Rings. *J. H. van Gorkom, Paul L. Schechter, and Jerome Kristian*. **314**, 457, 34-E3 (1987)
- Atomic Hydrogen in Planetary Nebulae. *Stephen E. Schneider, Peter R. Silberglate, Daniel R. Altschuler, and Carlo Giovanardi*. **314**, 572, 35-G1 (1987)
- Detection of H I Emission from the Circumstellar Envelope of Alpha Orionis. *P. F. Bowers and G. R. Knapp*. **315**, 305, 43-C4 (1987)
- The Leo Triplet Spiral Galaxy NGC 3628. I. VLA Observations of the Neutral Hydrogen Absorption. *J. T. Schmelz, W. A. Baan, and A. D.*

Haschick. **315**, 492, 46-B3 (1987)

- H I Gas near the Giant Elliptical Galaxy NGC 4472. *R. Sancisi, N. Thonnard, and R. D. Ekers*. **315**, L39, 45-D8 (1987)
- The Correlation of Spiral Arm Molecular Clouds with Cold Atomic Hydrogen. *W. L. Peters and F. N. Bash*. **317**, 646, 73-B8 (1987)
- The H I Distribution in Clouds within Galaxies. *E. J. Shaya and S. R. Federman*. **319**, 76, 93-G9 (1987)
- Discovery of Low-Redshift, Neutral Hydrogen Absorption in the Radio Spectrum of PKS 2020 - 370. *C. L. Carilli and J. H. van Gorkom*. **319**, 683, 102-D8 (1987)
- 21 Centimeter Study of Spiral Galaxies in the Coma Supercluster. *Giuseppe Gavazzi*. **320**, 96, 109-B3 (1987)
- H I Superclouds in the Inner Galaxy. *Bruce G. Elmegreen and Debra Meloy Elmegreen*. **320**, 182, 110-B1 (1987)
- The Structure and Evolution of Hoag's Object. *François Schweizer, W. Kent Ford, Jr., Robert Jedrzejewski, and Riccardo Giovanelli*. **320**, 454, 114-D3 (1987)
- Searching at 21 Centimeters for Galaxies behind the Milky Way. *Frank J. Kerr and Patricia A. Henning*. **320**, L99, 121-C2 (1987)
- Far-Infrared Properties of Cluster Galaxies. *Michael D. Bicay and Riccardo Giovanelli*. **321**, 645, 131-E11 (1987)
- Arecibo Observations of IRAS Galaxies at 21 and 18 Centimeters Wavelengths. *Robert W. Garwood, George Helou, and John M. Dickey*. **322**, 88, 138-G11 (1987)
- H I Detection Survey of a Complete Magnitude-limited Sample of Dwarf Irregular Galaxies in the Virgo Cluster Area. *G. Lyle Hoffman, George Helou, E. E. Salpeter, John Glosson, and A. Sandage*. **63**, 247, 4-A5 (1987) (Abstr. in **312**, 964, 13-E5)
- Neutral Hydrogen in Compact Groups of Galaxies. *B. A. Williams and Herbert J. Rood*. **63**, 265, 4-C8 (1987) (Abstr. in **312**, 964, 13-E5)
- H I Survey of Face-on Galaxies: The Frequency of Distortions in H I Disks. *B. M. Lewis*. **63**, 515, 9-A5 (1987) (Abstr. in **313**, 928, 26-G11)

Radio Sources: Variable

- Multiple Wavelength Microwave Observations of the RS Canum Venaticorum Stars UX Arietis, HR 1099, HR 5110, and II Pegasi. *Robert F. Willson and Kenneth R. Lang*. **312**, 278, 4-A2 (1987)
- 1928 + 738: A Superluminous Source with Large-Scale Structure. *K. J. Johnston, R. S. Simon, A. Eckart, P. Biermann, C. Schalinski, A. Witzel, and R. G. Strom*. **313**, L85, 27-D11 (1987)
- Simultaneous Multifrequency Observations of Markarian 421. *Jean Brodie, Stuart Bowyer, and Allyn Tennant*. **318**, 175, 80-G5 (1987)
- Radio Emission from the Nova-like Variable AC Cancri and the Symbiotic Variable AG Draconis. *Michael V. Torbett and Bel Campbell*. **318**, L29, 85-C2 (1987)
- The Fading of the Narrow-Line Region in 3C 390.3. *J. Clavel and W. Wamsteker*. **320**, L9, 114-A12 (1987)
- The Inner Beams of SS 433. *Jonathan D. Romney, Richard T. Schilizzi, István Fejes, and Ralph E. Spencer*. **321**, 822, 133-E3 (1987)
- Superluminous Motion in the Double-lobed Quasar 3C 245. *D. H. Hough and A. C. S. Readhead*. **321**, L11, 129-C1 (1987)
- Linear Polarization Structure of the BL Lacertae Object OJ 287 at Milliarcsecond Resolution. *D. H. Roberts, D. C. Gabuzda, and J. F. C. Wardle*. **323**, 536, 160-E5 (1987)
- The Accuracy of Cross-Correlation Estimates of Quasar Emission-Line Region Sizes. *C. Martin Gaskell and Bradley M. Peterson*. **65**, 1, 28-A5 (1987) (Abstr. in **319**, 1011, 106-A9)
- Daily Observations of Compact Extragalactic Radio Sources at 2695 and 8085 MHz, 1979-1985. *R. L. Fiedler, E. B. Waltman, J. H. Spencer, K. J. Johnston, P. E. Angerhofer, D. R. Florkowski, F. J. Josties, W. J. Klepczynski, D. D. McCarthy, and D. N. Matsakis*. **65**, 319, 33-A5 (1987) (Abstr. in **321**, 1050, 136-A1)

Relativity

- The Quadrupole Gravitational Lens. *Israel Kover*. **312**, 22, 1-B14 (1987)
- Mass Accretion on a Collapsed Star. *Amos Harpaz and Nathan Rosen*. **312**, 646, 10-A7 (1987)
- Remarks on the Necessity and Uniqueness of the Gravitational Stress-Energy Pseudotensor. *Thomas W. Noonan*. **313**, 37, 15-D1 (1987)
- X-Ray Radiation from the Intergalactic Plasma. *Xavier Barcons*. **313**, 547, 22-F11 (1987)
- The Impact of the Pressure Shift of Hydrogen Lines on "Relativistic" Masses of White Dwarfs. *B. Grabowski, J. Madej, and J. Halenka*. **313**, 750, 25-A8 (1987)
- The Effect of Viscosity on Neutron Star Oscillations. *Curt Cutler and Lee Lindblom*. **314**, 234, 30-F4 (1987)
- The Thick Gravitational Lens: A Lens Composed of Many Elements at Different Distances. *Israel Kover*. **316**, 52, 50-E10 (1987)
- Gravitational Lensing by an Ensemble of Isothermal Galaxies. *Neal Katz and Bohdan Paczyński*. **317**, 11, 64-B3 (1987)
- The Extragalactic Background Light and a Definitive Resolution of Olbers's Paradox. *Paul S. Wesson, K. Valle, and R. Stabell*. **317**, 601,

- 72-F5 (1987)
 Spatial Stability of Relativistic Jets: Application to 3C 345. *Philip E. Hardee*. **318**, 78, 79-F12 (1987)
 A Search for Sinusoidal Gravitational Radiation in the Period Range 30–2000 Seconds. *J. W. Armstrong, F. B. Estabrook, and H. D. Wahlquist*. **318**, 536, 86-F8 (1987)
 Simulations of Axisymmetric, Newtonian Star Clusters: Prelude to 2 + 1 General Relativistic Computations. *Stuart L. Shapiro and Saul A. Teukolsky*. **318**, 542, 86-G1 (1987)
 Extraction of Cosmological Information from Multiimage Gravitational Lenses. *Israel Kooner*. **318**, L1, 85-A4 (1987)
 Helicity Conservation Laws for Fluids and Plasmas. *Jacob D. Bekenstein*. **319**, 207, 95-C4 (1987)
 Hydrodynamical Constraints on Cosmic-Ray Acceleration in Relativistic Shocks. *G. M. Webb*. **319**, 215, 95-C12 (1987)
 Multifrequency VLB1 Observations of 4C 39.25: A Superluminal Source without a Well-defined Core. *Alan P. Marscher, David B. Shafer, Roy S. Booth, and Barry J. Geldzahler*. **319**, L69, 107-D7 (1987)
 How Big Are Supermassive Black Holes Formed from the Collapse of Dense Star Clusters? *Christopher S. Kochanek, Stuart L. Shapiro, and Saul A. Teukolsky*. **320**, 73, 108-G8 (1987)
 Probing Gravity to the Second Post-Newtonian Order and to One Part in 10^7 Using the Spin Axis of the Sun. *Ken Nordvedt*. **320**, 871, 119-C12 (1987)
 4U 1820 – 30 as a Potential Test of the Nonsymmetric Gravitational Theory of Moffat. *Timothy P. Krisher*. **320**, L47, 114-D8 (1987)
 Relativistic Thermal Plasmas: Time Development of Electron-Positron Pair Concentration. *Masaaki Kusunose*. **321**, 186, 124-C3 (1987)
 Shocked Relativistic Magnetohydrodynamic Flows with Application to Pulsar Winds. *Robert T. Emmering and Roger A. Chevalier*. **321**, 334, 125-G10 (1987)
 Relativistic Transport Theory for Cosmic Rays: Erratum. *G. M. Webb*. **321**, 606, 128-G2 (1987) (Orig. paper in **296**, 319, 93-D7)
 The Marginal Gravitational Lensing. *Israel Kooner*. **321**, 686, 132-A13 (1987)
 Particle Acceleration at Shocks: A Monte Carlo Method. *J. G. Kirk and P. Schneider*. **322**, 256, 140-F2 (1987)
 Gravitational Redshift and Mass-Radius Relation in White Dwarfs. *D. Koester*. **322**, 852, 149-B8 (1987)
 On the Radius of Neutron Stars. *P. Mészáros and H. Riffert*. **323**, L127, 164-D3 (1987)
 Extraction of Cosmological Information from Multiimage Gravitational Lenses: Erratum. *Israel Kooner*. **323**, L155, 164-E13 (1987) (Orig. paper in **318**, L1, 85-A4)
 Relativistic Free-free Gaunt Factor of the Dense High-Temperature Stellar Plasma. *Masayuki Nakagawa, Yasuharu Kohyama, and Naoki Itoh*. **63**, 661, 10-E14 (1987) (Abstr. in **313**, 930, 26-G13)
Rotation
 The Ellipticities of Globular Clusters and the Cyanogen Problem. *John Norris*. **313**, L65, 27-C7 (1987)
 Bipolar Flows, Molecular Gas Disks, and the Collapse and Accretion of Rotating Interstellar Clouds. *Alan P. Boss*. **316**, 721, 60-A6 (1987)
 Dark Matter in the Universe: Massive Neutrinos Revisited. *R. Cowik and P. Ghosh*. **317**, 26, 64-C4 (1987)
 The Equilibria of Rotating Isothermal Clouds. *Masayoshi Kiguchi, Shinji Narita, Shoken M. Miyama, and Chushiro Hayashi*. **317**, 830, 75-B5 (1987)
 Simulations of Axisymmetric, Newtonian Star Clusters: Prelude to 2 + 1 General Relativistic Computations. *Stuart L. Shapiro and Saul A. Teukolsky*. **318**, 542, 86-G1 (1987)
 Protostellar Formation in Rotating Interstellar Clouds. VI. Nonuniform Initial Conditions. *Alan P. Boss*. **319**, 149, 94-F2 (1987)
 Magnetic Braking in Weakly Ionized Media. *Arieh Königl*. **320**, 726, 117-F6 (1987)
 Nonlinear Magnetohydrodynamic Waves in a Steady Zonal Circulation for a Shallow Fluid Shell on the Surface of a Rotating Sphere. *Y. Q. Lou*. **322**, 862, 149-C4 (1987)
 A New Example of the Papaloizou-Pringle Instability. *M. A. Abramowicz, O. M. Blaes, and P. Ghosh*. **323**, 629, 161-E10 (1987)
Shock Waves
 Magnetohydrodynamic Shocks in Molecular Clouds. *David F. Chernoff*. **312**, 143, 2-E6 (1987)
 Ultra-High Energy Cosmic Rays in a Galactic Wind and Its Termination Shock. *J. R. Jokipii and G. Morfill*. **312**, 170, 2-G5 (1987)
 X-Ray and Ultraviolet Radiation from Accreting White Dwarfs. IV. Two-Temperature Treatment with Electron Thermal Conduction. *J. N. Imamura, R. H. Durisen, D. Q. Lamb, and G. J. West*. **313**, 298, 18-B14 (1987)
 Nonstochastic Prompt Proton Acceleration by Fast Magnetosonic Shocks in the Solar Plasma. *Yukiharu Ohsawa and Jun-ichi Sakai*. **313**, 440, 19-G4 (1987)
 The Growth of Linear Perturbations of Adiabatic Shock Waves. *Dongsu Ryu and Ethan T. Vishniac*. **313**, 820, 25-F8 (1987)
 Rate of Energy Gain and Maximum Energy in Diffusive Shock Acceleration. *J. R. Jokipii*. **313**, 842, 26-A2 (1987)
 Infrared Spectroscopy of the Supernova Remnant IC 443. *James R. Graham, Gillian S. Wright, and Andrew J. Longmore*. **313**, 847, 26-A7 (1987)
 A Sheet Description of the Emission from Middle-aged Supernova Remnants. *J. Jeff Hester*. **314**, 187, 30-A8 (1987)
 Velocity Structure of Stellar Atmospheres: R Scuti. *David Mozurkewich, R. D. Gehrz, K. H. Hinkle, and D. L. Lambert*. **314**, 242, 26-F12 (1987)
 Forbidden Coronal Iron Line Images of Puppis A: Cloud Evaporation or Shocked Cloud? *Richard G. Teske and Robert Petre*. **314**, 673, 37-A2 (1987)
 On the Acceleration of Charged Particles at Relativistic Shock Fronts. *J. G. Kirk and P. Schneider*. **315**, 425, 45-D1 (1987)
 High-Velocity Emission in Young Supernova Remnants: SN 1006 and SN 1572. *Robert P. Kirshner, P. Frank Winkler, and Roger A. Chevalier*. **315**, L135, 49-F3 (1987)
 Radiative Bow Shock Models of Herbig-Haro Objects. *Patrick Hartigan, John Raymond, and Lee Hartmann*. **316**, 323, 53-D14 (1987)
 Distributed Reacceleration of Cosmic Rays. *Amri Wandel, David Eichler, John R. Letaw, Rein Silberberg, and C. H. Tsao*. **316**, 676, 59-D13 (1987)
 Shock-Front Compression of the Magnetic Field in the Canis Major R1 Star Formation Region. *F. J. Vrba, R. Baierlein, and W. Herbst*. **317**, 207, 66-C4 (1987)
 Oxygen Chemistry of Shocked Interstellar Clouds. I. Rate Constants for Thermal and Nonthermal Internal Energy Distributions. *A. F. Wagner and M. M. Graff*. **317**, 423, 68-E11 (1987)
 Oxygen Chemistry of Shocked Interstellar Clouds. II. Effects of Non-thermal Internal Energy on Chemical Evolution. *M. M. Graff and A. Dalgarno*. **317**, 432, 68-F6 (1987)
 Can Distributed Acceleration Explain the Cosmic-Ray ^{15}N Abundance? *John R. Letaw*. **317**, L69, 78-C3 (1987)
 Detection of Vibration-Rotation Band Lines of Shocked CO in Orion. *T. R. Geballe and Ron Garden*. **317**, L107, 78-E9 (1987)
 Hydrogen Molecules and the Radiative Cooling of Pregalactic Shocks. *Paul R. Shapiro and Hyesung Kang*. **318**, 32, 79-C8 (1987)
 Forbidden Coronal Iron-Line Emission in the Puppis A Shock Front: The Effect of Inhomogeneities. *Richard G. Teske and Robert Petre*. **318**, 370, 83-A1 (1987)
 Excitation and Dissociation of Molecular Hydrogen in Shock Waves at Interstellar Densities. *J. E. Dove, A. C. M. Rusk, P. H. Cribb, and P. G. Martin*. **318**, 379, 83-A11 (1987)
 Diffusive Shock Acceleration: Comparison of a Unified Shock Model to Bow Shock Observations. *Donald C. Ellison and Eberhard Möbius*. **318**, 474, 84-B6 (1987)
 The Structure of Time-dependent Interstellar Shocks and Grain Destruction in the Interstellar Medium. *Christopher F. McKee, David J. Hollenbach, C. Gregory Seab, and A. G. G. M. Tielens*. **318**, 674, 88-C7 (1987)
 Were the Lyman- α Clouds Formed from Shocks? *Ethan T. Vishniac and Gary S. Burt*. **319**, 14, 93-B7 (1987)
 A Radiative Bow Shock Wave (?) Driven by Nuclear Ejecta in a Seyfert Galaxy. *Andrew S. Wilson and James S. Ulvestad*. **319**, 105, 94-B11 (1987)
 Late-Time Neutrino Heating and Energetics of Stalled Shocks in Type II Supernovae. *A. Ray and K. Kar*. **319**, 143, 94-E9 (1987)
 Hydrodynamical Constraints on Cosmic-Ray Acceleration in Relativistic Shocks. *G. M. Webb*. **319**, 215, 95-C12 (1987)
 Propagation of a Shock Wave in a Radiating Spherically Symmetric Distribution of Matter. *L. Herrera and L. Núñez*. **319**, 868, 104-D11 (1987)
 Shock Processing of Interstellar Dust: Diamonds in the Sky. *A. G. G. M. Tielens, C. G. Seab, D. J. Hollenbach, and Christopher F. McKee*. **319**, L109, 107-G6 (1987)
 Collapse of $9 M_{\odot}$ Stars. *E. Baron, J. Cooperstein, and S. Kahana*. **320**, 300, 111-D1 (1987)
 Collapsing White Dwarfs. *E. Baron, J. Cooperstein, S. Kahana, and K. Nomoto*. **320**, 304, 111-D5 (1987)
 Vacuum Ultraviolet Images of the Large Magellanic Cloud. *Andrew M. Smith, Robert M. Cornett, and Robert S. Hill*. **320**, 609, 116-C9 (1987)
 Energetic Particle Acceleration in Spherically Symmetric Accretion Flows and Shocks. *G. M. Webb and T. J. Bogdan*. **320**, 683, 117-C4 (1987)
 Electron Injection by Relativistic Protons in Active Galactic Nuclei.

Shock Waves—Continued

- Marek Sikora, John G. Kirk, Mitchell C. Begelman, and Peter Schneider. **320**, L81, 121-B1 (1987)
- Oblique Magnetohydrodynamic Shock Waves in Molecular Clouds. Mark Wardle and B. T. Draine. **321**, 321, 125-F8 (1987)
- Shocked Relativistic Magnetohydrodynamic Flows with Application to Pulsar Winds. Robert T. Emmering and Roger A. Chevalier. **321**, 334, 125-G10 (1987)
- The Origin of the Diffuse X-Ray Background and the Formation of Galaxies and Voids. Ruth A. Daly. **322**, 20, 138-B12 (1987)
- Convection in Supernova Theory. H. A. Bethe, G. E. Brown, and J. Cooperstein. **322**, 201, 140-B3 (1987)
- Particle Acceleration at Shocks: A Monte Carlo Method. J. G. Kirk and P. Schneider. **322**, 256, 140-F2 (1987)
- H₂O Line Emission from Shocked Gas. David A. Neufeld and Gary J. Melnick. **322**, 266, 140-F12 (1987)
- Radio Recombination Lines from Fast Shocks in Molecular Clouds, with Application to Bipolar Flows. Christopher F. McKee and David J. Hollenbach. **322**, 275, 140-G7 (1987)
- Synchrotron Emission from Shock Waves in Active Galactic Nuclei. P. L. Biermann and P. A. Strittmatter. **322**, 643, 146-G5 (1987)
- A Multiphasecraft Study of the Injection and Transport of Solar Energetic Particles. J. Beeck, G. M. Mason, D. C. Hamilton, G. Wibberenz, H. Kunow, D. Hoestadt, and B. Klecker. **322**, 1052, 151-D14 (1987)
- The Ionization Effects of Shock Breakout in SN 1987A. M. A. Dopita, S. J. Meatheringham, P. Nulsen, and P. R. Wood. **322**, L85, 152-C5 (1987)
- Time-dependent Bow Shocks and the Condensation Structure of Herbig-Haro Objects. A. C. Raga and K. H. Böhm. **323**, 193, 155-B10 (1987)
- On Pumping the Strong Water Maser Sources. Nikolaos D. Kylafis and Colin Norman. **323**, 346, 156-G1 (1987)
- Pair-Creation Effects in Accretion Shock Models of Active Galactic Nuclei. John M. Blondin and Arieh Königl. **323**, 451, 159-E1 (1987)
- Fermi Acceleration at Shocks with Arbitrary Velocity Profiles. Peter Schneider and John G. Kirk. **323**, L87, 158-G1 (1987)
- Sky Photographs**
- Specular Satellite Reflection and the 1985 March 19 Optical Outburst in Perseus. Paul D. Maly. **317**, L39, 71-C11 (1987)
- Evidence from Meteor Patrol Photographs for a Nonastronomical Origin of the Reported Optical Flashes in Perseus. I. Halliday, P. A. Feldman, and A. T. Blackwell. **320**, L153, 121-F11 (1987)
- Solar System: General**
- Evidence in Meteorites for an Active Early Sun. M. W. Caffee, C. M. Hohenberg, T. D. Swindle, and J. N. Goswami. **313**, L31, 21-C3 (1987)
- ¹⁶O Excesses in Murchison and Murray Hbonites: A Case Against a Late Supernova Injection Origin of Isotopic Anomalies in O, Mg, Ca, and Ti. A. J. Fahey, J. N. Goswami, K. D. McKeegan, and E. K. Zinner. **323**, L91, 158-G5 (1987)
- Spectrophotometry**
- Variability of the Optical Spectrum of NGC 5548 and Evidence for a Multiple-Component Broad-Line Region. Bradley M. Peterson. **312**, 79, 1-G11 (1987)
- Infrared Continuum Radiation from Red Giants. William K. Rose. **312**, 284, 4-A9 (1987)
- The Double Broad-Line Emitting Regions in NGC 5548 as Possible Evidence for a Supermassive Binary. Bradley M. Peterson, Kirk T. Korista, and Stephen A. Cota. **312**, L1, 7-A4 (1987)
- The Effect of the Lyman-Alpha Forest on the Ultraviolet Continua of Very High Redshift Quasars. Charles C. Steidel and Wallace L. W. Sargent. **313**, 171, 16-G7 (1987)
- The Ultraviolet Spectra of Intermediate-Redshift Quasars. II. A. L. Kinney, P. J. Huggins, A. E. Glassgold, and J. N. Bregman. **314**, 145, 29-E7 (1987)
- Low-Mass, Pre-Main-Sequence Stars: The Infrared Emission from Circumstellar Dust. M. G. Wolfire and E. Churchwell. **315**, 315, 43-C14 (1987)
- A Near-Infrared Study of the Luminous Merging Galaxies NGC 2623 and Arp 148. Marshall Joy and Paul M. Harvey. **315**, 480, 46-A4 (1987)
- Color Evolution in High-Redshift Galaxies. Peter R. M. Eisenhardt and M. J. Lebofsky. **316**, 70, 50-F14 (1987)
- Ultraviolet Spectra of HH 1 and HH 2: Spatial Variations and the Continuum Problem. K. H. Böhm, Th. Bührke, A. C. Raga, E. W. Bruge, A. N. Witt, and R. Mundt. **316**, 349, 53-G7 (1987)
- The Bare Nucleus of Comet Neujmin 1. Humberto Campins, Michael F. A'Hearn, and Lucy-Ann McFadden. **316**, 847, 61-D1 (1987)
- IRAS 1809 – 3211: Optically Known as "Gomez's Hamburger". Maria Teresa Ruiz, Victor Blanco, José Maza, Steve Heathcote, Andrew Phillips, Kimiaki Kawara, Claudio Anguita, Mario Hamuy, and Arturo Gómez. **316**, L21, 56-B10 (1987)
- Spectrophotometry of Six Broad Absorption Line QSOs. Vesa T. Junkkarinen, E. Margaret Burbidge, and Harding E. Smith. **317**, 460, 69-A7 (1987)
- Spectrophotometry of Comets Giacobini-Zinner and Halley. Stephen C. Tegler and C. R. O'Dell. **317**, 987, 77-A2 (1987)
- The Ultraviolet and Optical Emission-Line Spectrum of III Zw 77. Gary J. Ferland and Donald E. Osterbrock. **318**, 145, 80-E3 (1987)
- The Continuum of Type I Seyfert Galaxies. II. Separating Thermal and Nonthermal Components. N. P. Carleton, Martin Elvis, G. Fabbiano, S. P. Willner, A. Lawrence, and Martin Ward. **318**, 595, 87-D6 (1987)
- The Atmospheres of T Tauri Stars. I. High-Resolution Calibrated Observations of Moderately Active Stars. Ulrich Finkenzeller and Gabor Basri. **318**, 823, 90-A2 (1987)
- Near-Infrared and Optical Observations of IRAS Sources in and near Dense Cores. P. C. Myers, Gary A. Fuller, R. D. Mathieu, C. A. Beichman, P. J. Benson, R. E. Schild, and J. P. Emerson. **319**, 340, 96-F5 (1987)
- Hot Dust and the Near-Infrared Bump in the Continuum Spectra of Quasars and Active Galactic Nuclei. Richard Barvainis. **320**, 537, 115-D4 (1987)
- Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storchi-Bergmann, and J. Matthews. **320**, 589, 116-B3 (1987)
- Supernova 1987A in the Large Magellanic Cloud: Possible s-Process Enhancements in the Progenitor. R. E. Williams. **320**, L117, 121-D4 (1987)
- IRAS 18059 – 3211: Optically Known As Gomez's Hamburger: Erratum. M. T. Ruiz, V. Blanco, J. Maza, S. Heathcote, A. Phillips, K. Kawara, C. Anguita, M. Hamuy, and A. Gomez. **320**, L157, 121-F14 (1987) (Orig. paper in **316**, L21, 56-B10)
- Broad-Band Properties of the CFA Seyfert Galaxies. II. Infrared to Millimeter Properties. R. A. Edelson, M. A. Malkan, and G. H. Rieke. **321**, 233, 124-G1 (1987)
- Constraints on Quasar Accretion Disks from the Optical/Ultraviolet/Soft X-Ray Big Bump. Bozena Czerny and Martin Elvis. **321**, 305, 125-E5 (1987)
- Spectrophotometry of Epsilon Aurigae. D. T. Thompson, B. L. Lutz, G. W. Lockwood, and J. R. Sowell. **321**, 450, 127-B1 (1987)
- Spectral Synthesis in the Ultraviolet. I. Far-Ultraviolet Stellar Library. Michael N. Fanelli, Robert W. O'Connell, and Trinh X. Thuan. **321**, 768, 133-A1 (1987)
- Airborne Spectrophotometry of Eta Carinae from 4.5 to 7.5 Microns and a Model for Source Morphology. Ray W. Russell, David K. Lynch, John A. Hackwell, Richard J. Rudy, George S. Rossano, and M. W. Castelar. **321**, 937, 134-G1 (1987)
- Ultraviolet Interstellar Extinction toward NGC 6530 and the Intrinsic Energy Distribution of 9 Sagittarii and HD 165052. Ana V. Torres. **322**, 949, 150-C7 (1987)
- Quasar Energy Distributions. I. Soft X-Ray Spectra of Quasars. Belinda J. Wilkes and Martin Elvis. **323**, 243, 155-F5 (1987)
- Spectral Energy Distributions of T Tauri Stars: Disk Flaring and Limits on Accretion. S. J. Kenyon and L. Hartmann. **323**, 714, 162-E3 (1987)
- Continuum Energy Distributions of Quasars in the Palomar-Green Survey. G. Neugebauer, R. F. Green, K. Matthews, M. Schmidt, B. T. Soifer, and J. Bennett. **63**, 615, 10-A7 (1987) (Abstr. in **313**, 929, 26-G12)
- DDO, Cousins R – I, and Photomultiplier Scanner Data for an Analysis of Very Strong Lined K Giants. Scott B. Johnson, Michael D. Jone, and Benjamin J. Taylor. **63**, 983, 16-B1 (1987) (Abstr. in **314**, 833, 38-F9)
- An Atlas of Optical Spectrophotometry of Wolf-Rayet Carbon and Oxygen Stars. Ana V. Torres and Philip Massey. **65**, 459, 35-A2 (1987) (Abstr. in **321**, 1053, 136-A4)
- Stars: Abundances**
- CO Band Synthesis and the Interpretation of Band Strengths in Magellanic Cloud Supergiants. Peter J. McGregor. **312**, 195, 3-B2 (1987)
- Nitrogen and Sulfur Overabundances in the Population II Supergiant HD 46703. Howard E. Bond and R. Earle Luck. **312**, 203, 3-B10 (1987)
- A Discussion of Epsilon Eridani's Age, Composition, and Oscillation Spectrum. D. B. Guenther. **312**, 211, 3-C4 (1987)
- On the Interpretation of the Sandage Period-Shift Effect among Globular Cluster RR Lyrae Variables. Allen V. Sweigart, Alvio Renzini, and Amedeo Tonnarelli. **312**, 762, 11-C4 (1987)
- Lithium in F Stars of Known Age. Ann M. Boesgaard and Michael J. Tripicco. **313**, 389, 19-C8 (1987)
- Maxwellian-averaged Neutron Capture Cross Sections for ⁹⁹Tc and

- ⁹⁵⁻⁹⁸ Mo. R. R. Winters and R. L. Macklin. **313**, 808, 25-E10 (1987)
- Chemical Evolution, Stellar Nucleosynthesis, and A Variable Star Formation Rate. Keith A. Olive, Friedrich-Karl Thielemann, and James W. Truran. **313**, 813, 25-F1 (1987)
- The Ellipticities of Globular Clusters and the Cyanogen Problem. John Norris. **313**, L65, 27-C7 (1987)
- New Lines of Ethylene and a Search for Methylene in IRC +10216. D. M. Goldhaber, A. L. Betz, and J. J. Ottusch. **314**, 356, 32-A13 (1987)
- Neutron Capture Nucleosynthesis during Core Helium Burning in Massive Stars. N. Prantzos, M. Arnould, and J.-P. Arcoragi. **315**, 209, 42-C6 (1987)
- Two Micron CO Absorption Lines in the Spectrum of Epsilon Aurigae during Eclipse. Kenneth H. Hinkle and Theodore Simon. **315**, 296, 43-B9 (1987)
- Galactic Chemical Evolution: z versus $\lambda n(1/\mu)$ Relationship. Donald D. Clayton. **315**, 451, 45-F1 (1987)
- Main-Sequence CCD Photometry of the Globular Cluster NGC 362. Michael Bolte. **315**, 469, 45-G6 (1987)
- A Reanalysis of Galactic Primary Nucleosynthesis. Bruce A. Twarog and J. Craig Wheeler. **316**, 153, 51-F1 (1987)
- Chemical Enrichment of Halo Protoclusters with Differing Stellar Mass Functions. Graeme H. Smith and Robert D. McClure. **316**, 206, 52-C3 (1987)
- Oxygen Isotopic Abundances in Evolved Stars. III. 26 Carbon Stars. Michael J. Harris, David L. Lambert, Kenneth H. Hinkle, Bengt Gustafsson, and Kjell Eriksson. **316**, 294, 53-B14 (1987)
- The Effects of Stimulated Star Formation on the Evolution of the Galaxy. III. The Chemical Evolution of Nonlinear Systems. Steven N. Shore, Federico Ferrini, and Francesco Palla. **316**, 663, 59-C14 (1987)
- The Composition Gradient across M81. D. R. Garnett and G. A. Shields. **317**, 82, 64-G7 (1987)
- The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uomoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein, D. R. Garnett, and R. M. Leveault. **317**, 355, 67-F14 (1987)
- S-Matrix Calculation of the Triple-Alpha Reaction. Ikko Fushiki and D. Q. Lamb. **317**, 368, 68-A1 (1987)
- Carbon-to-Nitrogen Ratios along the Evolutionary Sequence of M67. Jeffery A. Brown. **317**, 701, 73-F7 (1987)
- The Core Helium Flash and Surface Abundance Anomalies. Robert G. Deupree and Richard K. Wallace. **317**, 724, 74-A4 (1987)
- The Lithium Abundance in Halo Stars. L. M. Hobbs and Douglas K. Duncan. **317**, 796, 74-F10 (1987)
- Carbon ($^{12}\text{C}/^{13}\text{C}$) and Oxygen ($^{16}\text{O}/^{17}\text{O}$) Isotopic Ratios in Seven Evolved Stars. James F. Dominy and George Wallerstein. **317**, 810, 74-G11 (1987)
- Theoretical Stellar Luminosity Functions and the Ages and Compositions of Globular Clusters. Stephen J. Ratcliff. **318**, 196, 81-A13 (1987)
- Studies of Hot B Subdwarfs. V. Continuing Investigation of the C, N, and Si Abundance Patterns in the Atmospheres of sdB Stars. R. Lamontagne, F. Wesemael, and G. Fontaine. **318**, 844, 90-C1 (1987)
- A Search for $^{14}\text{C}/^{16}\text{O}$ in the Atmospheres of Evolved Stars. Michael J. Harris and David L. Lambert. **318**, 868, 90-D12 (1987)
- Elemental Technetium and Promethium as Cosmic-Ray Clocks. J. Drach and M. H. Salamon. **319**, 237, 95-E9 (1987)
- BVI CCD Photometry of 47 Tucanae. Gonzalo Alcaino and William Liller. **319**, 304, 96-C9 (1987)
- Abundances in Red Giant Stars: Carbon and Oxygen Isotopes in Carbon-rich Molecular Envelopes. P. G. Wannier and R. Sahai. **319**, 367, 97-B2 (1987)
- Deep CCD Photometry of the Globular Cluster NGC 7099. Michael Bolte. **319**, 760, 103-D1 (1987)
- Ultraviolet and Visual Spectroscopy of DB White Dwarfs. G. Wegner and E. P. Nelan. **319**, 916, 105-A5 (1987)
- The Pleiades Rapid Rotators: Evidence for an Evolutionary Sequence. R. Paul Butler, Ross D. Cohen, Douglas K. Duncan, and Geoffrey W. Marcy. **319**, L19, 100-B9 (1987)
- The Abundance of Gallium in B-Type Chemically Peculiar Stars: Addendum. Masahide Takada-Hidai, Kozo Sadakane, and Jun Jugaku. **320**, 437, 112-G4 (1987) (Orig. paper in **304**, 425, 58-D14)
- Spectroscopy of the Rapidly Rotating K Star HD 36705. O. Vilhu, B. Gustafsson, and B. Edvardsson. **320**, 850, 119-B5 (1987)
- Neutron-Exposure Variations in MS and S Stars, and the Implications for s-Process Nucleosynthesis. Verne V. Smith, David L. Lambert, and Andrew McWilliam. **320**, 862, 119-C3 (1987)
- The Age of the Large Magellanic Cloud Cluster NGC 2193. G. S. Da Costa, Christopher R. King, and J. R. Mould. **321**, 735, 132-E6 (1987)
- The s-Process Nucleosynthesis of Barium Stars. Robert A. Malaney. **321**, 832, 133-E13 (1987)
- Lithium in the Coma Cluster. Ann Merchant Boesgaard. **321**, 967, 135-B3 (1987)
- Selective Mass Loss, Abundance Anomalies, and Helium-rich Stars. G. Michaud, J. Dupuis, G. Fontaine, and T. Montmerle. **322**, 302, 141-B7 (1987)
- Determination of Photospheric Helium Abundances for the Hot White Dwarfs LB 1663 and CD -38°10980 from EXOSAT Soft X-Ray Photometry. F. B. S. Paerels, J. Heise, S. M. Kahn, and R. D. Rogers. **322**, 315, 141-C6 (1987)
- The "Alternative X" Question: What Causes the Strong Molecular Bands and Damping Lines in the Very Strong Lined (Super-Metal-rich) Stars? Benjamin J. Taylor and Scott B. Johnson. **322**, 930, 150-B2 (1987)
- Chemical Enrichment of Halo Protoclusters with Differing Stellar Mass Functions: Erratum. Graeme H. Smith and Robert D. McClure. **322**, 1074, 151-F12 (1987) (Orig. paper in **316**, 206, 52-C3)
- Atmospheric Eclipses in the SMC Wolf-Rayet Eclipsing Binary HD 5980: The Heavy versus the Light Metal Abundance. G. Koenigsberger, A. F. J. Moffat, and L. H. Auer. **322**, L41, 145-C12 (1987)
- Spectroscopy of the $\lambda 7699$ K I Line among Globular Cluster Giants. Bruce Campbell and Graeme H. Smith. **323**, L69, 158-E11 (1987)
- An Empirical Model for the Wolf-Rayet Star HD 50896. D. J. Hillier. **323**, 965, 15-G12 (1987) (Abstr. in **314**, 833, 38-F9)
- DDO, Cousins $R-I$, and Photomultiplier Scanner Data for an Analysis of Very Strong Lined K Giants. Scott B. Johnson, Michael D. Jener, and Benjamin J. Taylor. **323**, 983, 16-B1 (1987) (Abstr. in **314**, 833, 38-F9)
- Atmospheric Abundances of Classical Metallic-Line A Stars: The Visual Spectral Region. M. C. Lane and John B. Lester. **323**, 137, 29-D1 (1987) (Abstr. in **319**, 1013, 106-A11)
- Stars: Accretion**
- Further Evidence for Disk Accretion in FU Orionis Objects. L. Hartmann and S. J. Kenyon. **312**, 243, 3-E8 (1987)
- Mass Accretion on a Collapsed Star. Amos Harpaz and Nathan Rosen. **312**, 646, 10-A7 (1987)
- Anisotropic Radiation Fields Produced by Scattering in Thick Accretion Disks. J. Madej, C. Loken, and R. N. Henriksen. **312**, 652, 10-A13 (1987)
- Radiation Gas Dynamics of Polar Cap Accretion onto Magnetized Neutron Stars: Basic Theory. Jonathan Arons, Richard I. Klein, and Susan M. Lea. **312**, 666, 10-C1 (1987)
- X-Ray and Ultraviolet Radiation from Accreting White Dwarfs. IV. Two-Temperature Treatment with Electron Thermal Conduction. J. N. Imamura, R. H. Durisen, D. Q. Lamb, and G. J. Weast. **313**, 298, 18-B14 (1987)
- Thermal and Dynamical Effects of Pair Production on Two-Temperature Accretion Flows. Mitchell C. Begelman, Marek Sikora, and Martin J. Rees. **313**, 689, 24-C12 (1987)
- Deceleration of Infalling Plasma in the Atmospheres of Accreting Neutron Stars. I. Isothermal Atmospheres. G. S. Miller, E. E. Salpeter, and J. Wasserman. **314**, 215, 30-D13 (1987)
- Thermal Evolution of Accreting Neutron Stars. II. Long X-Ray Bursts as a Probe Into the Interior. Masayuki Y. Fujimoto, Tomoyuki Hanawa, Icko Iben, Jr., and Martin B. Richardson. **315**, 198, 42-B9 (1987)
- Off-Center Ignition of Nuclear Burning in Merging White Dwarfs. Yasushi Kawai, Hideyuki Saio, and Ken'ichi Nomoto. **315**, 229, 42-D12 (1987)
- Two Micron CO Absorption Lines in the Spectrum of Epsilon Aurigae during Eclipse. Kenneth H. Hinkle and Theodore Simon. **315**, 296, 43-B9 (1987)
- Self-collimated Electromagnetic Jets from Magnetized Accretion Disks. R. V. E. Lovelace, J. C. L. Wang, and M. E. Sulkanen. **315**, 504, 46-C1 (1987)
- Numerical Simulations of Adiabatic Axisymmetric Accretion Flow. I. A New Mechanism for the Formation of Jets. B. A. Fryxell, Ronald E. Taam, and S. L. W. McMillan. **315**, 536, 46-E5 (1987)
- Multipeaked X-Ray Bursts from 4U/MXB 1636 - 53: Evidence for Burst-induced Accretion Disk Coronae. Fulvio Melia. **315**, L43, 45-D12 (1987)
- Effects of Electron-Positron Pair Opacity for Spherical Accretion onto Black Holes. Alan P. Lightman, Andrzej A. Zdziarski, and Martin J. Rees. **315**, L113, 49-D8 (1987)
- The Observational Appearance of Protostellar Accretion Disks. J. H. Beall. **316**, 227, 52-D10 (1987)
- The Evolution of Magnetic Cataclysmic Variables. J. M. Hameury, A. R. King, J. P. Lasota, and H. Ritter. **316**, 275, 53-A9 (1987)
- High-Luminosity Accretion in Wind-driven Binary X-Ray Sources. Cheng Ho and Jonathan Arons. **316**, 283, 53-B3 (1987)
- A Linear Thermal Stability Analysis for the Vertical Structure of Alpha

Stars: Accretion—Continued

- Model Accretion Disks. Hideyuki Saio, John K. Cannizzo, and J. Craig Wheeler. **316**, 716, 60-A1 (1987)
- On Interacting Helium Star—White Dwarf Pairs as Supernova Precursors. Icko Iben, Jr., Kenichi Nomoto, Amedeo Tornambè, and Alexander V. Tutukov. **317**, 717, 73-G11 (1987)
- Spin-up and Mixing in Accreting White Dwarfs. Mario Livio and James W. Truran. **318**, 316, 82-C12 (1987)
- Massive Disk Formation from the Collision of a Main-Sequence Star with a White Dwarf in a Globular Cluster Core. Noam Soker, Oded Regev, Mario Livio, and Michael M. Shara. **318**, 760, 89-C4 (1987)
- Power Spectra of Quasi-periodic Oscillations in Luminous X-Ray Stars. N. Shibasaki and F. K. Lamb. **318**, 767, 89-C11 (1987)
- EXOSAT Observations of 4U/MXB 1636–53: On the Relation between the Amount of Accreted Fuel and the Strength of an X-Ray Burst. W. H. G. Lewin, W. Penninx, J. van Paradijs, E. Damen, M. Sztajno, J. Trümper, and M. van der Klis. **319**, 893, 104-F9 (1987)
- On the Theory of Type I X-Ray Bursts. The Energetics of Bursts and the Nuclear Fuel Reservoir in the Envelope. Masayuki Y. Fujimoto, Mirek Sztajno, Walter H. G. Lewin, and Jan van Paradijs. **319**, 902, 104-G5 (1987)
- A Rapid Change of the Hercules X-1 Pulse Profile and High-State Duration. Yang Soong, Duane E. Gruber, and Richard E. Rothschild. **319**, L77, 107-E3 (1987)
- The Spectral Evolution of Dwarf Nova Outbursts. John K. Cannizzo and Scott J. Kenyon. **320**, 319, 111-E6 (1987)
- Polarized Radiation from Extended Magnetic Polar Caps. G. Channugam and J. Frank. **320**, 746, 118-A1 (1987)
- Deterministic Chaos in Accreting Systems: Analysis of the X-Ray Variability of Hercules X-1. W. Voges, H. Atmanspacher, and H. Scheingraber. **320**, 794, 118-D10 (1987)
- Stellar Accretion of Matter Possessing Angular Momentum. G. Siegfried Kutter and Warren M. Sparks. **321**, 386, 126-D7 (1987)
- Nuclear Runaways in a C/O White Dwarf Accreting H-rich Material Possessing Angular Momentum. Warren M. Sparks and G. Siegfried Kutter. **321**, 394, 126-E1 (1987)
- Fluctuation of Wind-driven Accretion in X-Ray Binaries. Cheng Ho and Jonathan Arons. **321**, 404, 126-E11 (1987)
- CAL 83: A Puzzling X-Ray Source in the Large Magellanic Cloud. David Crampton, A. P. Cowley, J. B. Hutchings, Paul C. Schmidtke, I. B. Thompson, and James Liebert. **321**, 745, 132-F3 (1987)
- The Eclipses of Cataclysmic Variables. II. U Geminorum. E.-H. Zhang and Edward L. Robinson. **321**, 813, 133-D8 (1987)
- The Effect of Heating from the Boundary Layer on Accretion Models for Novae and Other Compact Objects. Giora Shaviv and Sumner Starrfield. **321**, L51, 129-F3 (1987)
- X-Ray Irradiated Accretion Disks and Bimodal States. H. Inoue and R. Hoshi. **322**, 320, 141-C11 (1987)
- The Spectra of Accretion Disks and Their Application to Low-Mass X-Ray Binaries. Ronald E. Taam and P. Mészáros. **322**, 329, 141-D6 (1987)
- High Spectral Resolution Infrared Observations of V1057 Cygni. L. Hartmann and S. J. Kenyon. **322**, 393, 142-B6 (1987)
- The Effect of Decay of the Amplitude of Oscillation on Random Process Models for QPO X-Ray Stars. N. Shibasaki, R. F. Elsner, and M. C. Weisskopf. **322**, 831, 149-A1 (1987)
- The Discovery of Near-Infrared Polarized Cyclotron Emission in the Intermediate Polar BG Canis Minoris. Steven C. West, Graham Berriman, and Gary D. Schmidt. **322**, L35, 145-C7 (1987)
- Radiation-Hydrodynamic Calculation of Sub-Eddington Accretion Disks. G. E. Eggum, F. V. Coroniti, and J. I. Katz. **323**, 634, 161-F1 (1987)
- Spectral Energy Distributions of T Tauri Stars: Disk Flaring and Limits on Accretion. S. J. Kenyon and L. Hartmann. **323**, 714, 162-E3 (1987)
- New Insights from a Global View of X-Ray Bursts. Ikko Fushiki and D. Q. Lamb. **323**, L55, 158-D10 (1987)
- Atlas of Time-resolved Spectrophotometry of Cataclysmic Variables. R. Kent Honeycutt, Ronald H. Kaitchuck, and Eric M. Schlegel. **65**, 451, 34-D4 (1987) (Abstr. in **321**, 1052, 136-A3)
- Stars: Atmospheres**
- Model Atmospheres for Cooling Neutron Stars. Roger W. Romani. **313**, 718, 24-E13 (1987)
- The Impact of the Pressure Shift of Hydrogen Lines on "Relativistic" Masses of White Dwarfs. B. Grabowski, J. Madej, and J. Halenka. **313**, 750, 25-A8 (1987)
- MR Cygni Revisited. Albert P. Linnell and Josef Kalrath. **316**, 754, 60-C12 (1987)
- Theory of Transition-Layer Emission Measures and Coronae. Erika Böhm-Vitense. **317**, 750, 74-C2 (1987)
- Evidence for Periodic Radial Velocity Variations in Arcturus. P. H. Smith, R. S. McMillan, and W. J. Merline. **317**, L79, 78-C12 (1987)
- Studies of Hot B Subdwarfs. V. Continuing Investigation of the C, N, and Si Abundance Patterns in the Atmospheres of sdB Stars. R. Lamontagne, F. Wesemael, and G. Fontaine. **318**, 844, 90-C1 (1987)
- A New Formulation of the Starspot Model, and the Consequences of Starspot Structure. J. D. Dorren. **320**, 756, 118-A11 (1987)
- Wave Energy in White Dwarf Atmospheres. I. Magnetohydrodynamic Energy Spectra for Homogeneous DB and Layered DA Stars. Zdzisław E. Musielak. **322**, 234, 140-D8 (1987)
- Spectral Flux from Low-Density Photospheres: Low-Temperature Results. Stephen Hershkowitz and Robert V. Wagoner. **322**, 967, 150-D11 (1987)
- Effect of Balmer Continuum Absorption on Line Emission from Be Stars. Krishna M. V. Apparao and S. P. Tarafdar. **322**, 976, 150-E7 (1987)
- OH and CH Continuous Opacity in Solar and Stellar Atmospheres. Robert L. Kurucz, Ewine F. van Dishoeck, and S. P. Tarafdar. **322**, 992, 150-F13 (1987)
- The Thermodynamics of Anisotropic Radiating Systems. Albert Fu. **323**, 211, 155-D1 (1987)
- Physical Constraints on Variable Eddington Factors for the Gray Problem in Radiative Transfer. Albert Fu. **323**, 227, 155-E3 (1987)
- Model Atmospheres of Near-Eddington Limit X-Ray Bursters. Arif Babul and Bohdan Paczyński. **323**, 582, 161-B5 (1987)
- Theoretical Isochrones for Globular Clusters with Predicted Thuan-Gunn Photometry. R. A. Bell and Don A. Vandenberg. **63**, 335, 5-D10 (1987) (Abstr. in **312**, 966, 13-E7)
- Modeling the Extended Atmospheres of WN Stars. D. J. Hillier. **63**, 947, 15-F8 (1987) (Abstr. in **314**, 833, 38-F9)
- An Empirical Model for the Wolf-Rayet Star HD 50896. D. J. Hillier. **63**, 965, 15-G12 (1987) (Abstr. in **314**, 833, 38-F9)
- Stars: Ba II**
- Supernova 1987A in the Large Magellanic Cloud: Possible s-Process Enhancements in the Progenitor. R. E. Williams. **320**, L117, 121-D4 (1987)
- The s-Process Nucleosynthesis of Barium Stars. Robert A. Malaney. **321**, 832, 133-E13 (1987)
- Stars: Be**
- The Infrared Emission-Line Spectrum of γ Cassiopeiae. F. Hamann and M. Simon. **318**, 356, 82-F10 (1987)
- Highly Ionized Stellar Winds in Be Stars: The Evidence for Aspect Dependence. C. A. Grady, K. S. Bjorkman, and T. P. Snow. **320**, 376, 112-B8 (1987)
- Time Variability of Gamma Cassiopeiae in X-Rays. F. Frontera, D. Dal Fiume, N. R. Robba, G. Manzo, S. Re, and E. Costa. **320**, L127, 121-D13 (1987)
- Effect of Balmer Continuum Absorption on Line Emission from Be Stars. Krishna M. V. Apparao and S. P. Tarafdar. **322**, 976, 150-E7 (1987)
- Recurrent Episodic Mass Loss in a B2e Star: 66 Ophiuchi, 1982–1985. C. A. Grady, George Sonneborn, Chi-Chao Wu, and H. F. Henrichs. **65**, 673, 39-A2 (1987) (Abstr. in **322**, 1077, 151-G3)
- Stars: β Cephei**
- Pioneer 10 Observations of the Beta Cephei Stars Gamma Pegasi and Delta Ceti. Geraldine J. Peters, H. S. Ogawa, K. S. Judge, and D. L. Judge. **314**, 261, 31-A3 (1987)
- Stars: Binaries**
- Multiple Wavelength Microwave Observations of the RS Canum Venaticorum Stars UX Arietis, HR 1099, HR 5110, and II Pegasi. Robert F. Willson and Kenneth R. Lang. **312**, 278, 4-A2 (1987)
- The Dynamical Fate of Wide Binaries in the Solar Neighborhood. Martin D. Weinberg, Stuart L. Shapiro, and Ira Wasserman. **312**, 367, 4-G9 (1987)
- The Wolf-Rayet Population in 30 Doradus and Its Surroundings. Anthony F. J. Moffat, Virpi S. Niemela, M. M. Phillips, You-hua Chu, and Wilhelm Seggewiss. **312**, 612, 9-E7 (1987)
- An Eight-Year Spectroscopic Orbit for the WC7 + O4 Wolf-Rayet Binary HD 193793: Toward Solving the Mystery of the Infrared Outbursts. Anthony F. Moffat, Robert Lamontagne, Peredur M. Williams, Jiri Horn, and Wilhelm Seggewiss. **312**, 807, 11-F8 (1987)
- The Discovery of a Second Orbital Period from the X-Ray Source 4U 1820–30 in the Globular Cluster NGC 6624. L. Stella, W. Priedhorsky, and N. E. White. **312**, L17, 7-B4 (1987)
- The Formation of Ultra-Short Period Binaries in Globular Clusters. Frank Verbunt. **312**, L23, 7-B9 (1987)
- On the Binary Nature of Van Biesbroeck 8. C. Perrier and J.-M. Mariotti. **312**, L27, 7-B12 (1987)
- Variable Radio Emission from the 4 Draconis System. Alexander Brown. **312**, L51, 14-C7 (1987)
- Evolutionary Scenarios for Intermediate-Mass Stars in Close Binaries. Icko Iben, Jr. and Alexander V. Tutukov. **313**, 727, 24-F8 (1987)

- The Exotic Helium Variable PG 1346 + 082. *M. A. Wood, D. E. Winget, R. E. Nather, Frederic V. Hessman, James Liebert, Donald W. Kurtz, F. Wesemael, and G. Wegner.* **313**, 757, 25-B1 (1987)
- A Pre-Main-Sequence Star in the Detached Binary EK Cephei. *Daniel M. Popper.* **313**, L81, 27-D7 (1987)
- The Incidence of Close Binaries among Stars of Low Mass: Astrophysical Binaries. *Arthur Young, Sina Sadjadi, and Eugene Harlan.* **314**, 272, 31-B1 (1987)
- IE 1048.5 + 5421: A New 114 Minute AM Herculis Binary. *Simon L. Morris, Gary D. Schmidt, James Liebert, John Stocke, Isabella M. Gioia, and Tommaso Maccacaro.* **314**, 641, 36-E8 (1987)
- The Nature of the Recurrent Novae. *Ronald F. Webbink, Mario Livio, James W. Truran, and Marina Orio.* **314**, 653, 36-F9 (1987)
- Discovery of Three New RS Canum Venaticorum-like Counterparts to HEAO 1 X-Ray Sources. *D. A. H. Buckley, I. R. Tuohy, R. A. Remillard, H. V. Bradt, and D. A. Schwartz.* **315**, 273, 42-G14 (1987)
- Multipeaked X-Ray Bursts from 4U/MXB 1636 - 53: Evidence for Burst-induced Accretion Disk Coronae. *Fulvio Melia.* **315**, L43, 45-D12 (1987)
- An 8.5 Hour X-Ray Period in the M15 X-Ray Source 4U 2129 + 12. *Paul Hertz.* **315**, L119, 49-D14 (1987)
- Blue Straggler Stars in the Globular Cluster NGC 5466. *James M. Nemec and Hugh C. Harris.* **316**, 172, 51-G7 (1987)
- The Evolution of Magnetic Cataclysmic Variables. *J. M. Hameury, A. R. King, J. P. Lasota, and H. Ritter.* **316**, 275, 53-A9 (1987)
- Einstein Observations of EF Eridani (2A 0311 - 227), the Textbook Example of AM Herculis-type Systems. *K. Beuermann, L. Stella, and J. Patterson.* **316**, 360, 54-A6 (1987)
- Stellar Activity in Synchronized Binaries. II. A Correlation Analysis with Single Stars. *Gibor Basri.* **316**, 377, 54-B9 (1987)
- BE Ursae Majoris: A Detached Binary with a Unique Reprocessing Spectrum. *Donald H. Ferguson, James Liebert, Roc Cutri, Richard F. Green, S. P. Willner, João E. Steiner, and Susan Tokarz.* **316**, 399, 54-D4 (1987)
- Spectroscopic Observations of the Symbiotic Binary RW Hydrae. *Scott J. Kenyon and Telmo Fernandez-Castro.* **316**, 427, 54-F9 (1987)
- Evolution of N-Body Systems with Tidally Captured Binaries through the Core Collapse Phase. *Thomas S. Statler, Jeremiah P. Ostriker, and Haldan N. Cohn.* **316**, 626, 58-G9 (1987)
- Models for Type Ia Supernovae with Composition Inversions. *J. Craig Wheeler, Douglas Swartz, Zong-wei Li, and Peter G. Sutherland.* **316**, 733, 60-B5 (1987)
- On the Evolution of Tidal Capture X-Ray Binaries: 4U 2127 + 12 (M15) to 4U 1820 - 30 (NGC 6624). *Charles D. Bailyn and Jonathan E. Grindlay.* **316**, L25, 56-C3 (1987)
- On the Reality of Certain Spectroscopic Orbits. *C. L. Morbey and R. F. Griffin.* **317**, 343, 67-F1 (1987)
- Implications for Solar-Type Binary Statistics of the Morbey-Griffin Improved Binary Analysis. *Helmut A. Abt.* **317**, 353, 67-F11 (1987)
- On Interacting Helium Star-White Dwarf Pairs as Supernova Precursors. *Icko Iben, Jr., Ken'ichi Nomoto, Amedeo Tornambè, and Alexander V. Tutukov.* **317**, 717, 73-G11 (1987)
- Time-resolved Spectrophotometry of the Cataclysmic Variable EX Hydrae. *Ronald H. Kitchuck, Panayiotis A. Hantzios, Panagiotis Kakaletis, R. Kent Honeycutt, and Eric M. Schlegel.* **317**, 765, 74-D3 (1987)
- "Marginal" BY Draconis Stars. *Bernard W. Bopp.* **317**, 781, 74-E8 (1987)
- Duplicity among Stars with Strong Chromospheric Ca II Emission Lines: A Statistical Survey. *Arthur Young, Richard A. Mielbrecht, and Helmut A. Abt.* **317**, 787, 74-F1 (1987)
- The Formation and Evolution of Tidal Binary Systems. *Stephen L. W. McMillan, P. N. McDermott, and Ronald E. Taam.* **318**, 261, 81-F11 (1987)
- Absorption Features from the Accretion Column in E1405 - 451. *D. T. Wickramasinghe, I. R. Tuohy, and N. Visvanathan.* **318**, 326, 82-D8 (1987)
- The Binary Frequency of High-Velocity Field Dwarfs as Obtained with CCD Measures. *Helmut A. Abt and Daryl W. Willmarth.* **318**, 786, 89-E1 (1987)
- Thresholds for Rapid Mass Transfer in Binary System. I. Polytropic Models. *Michael S. Hjellming and Ronald F. Webbink.* **318**, 794, 89-E10 (1987)
- Radio Emission from the Nova-like Variable AC Cancri and the Symbiotic Variable AG Draconis. *Michael V. Torbett and Bel Campbell.* **318**, L29, 85-C2 (1987)
- Protostellar Formation in Rotating Interstellar Clouds. VI. Nonuniform Initial Conditions. *Alan P. Boss.* **319**, 149, 94-F2 (1987)
- CCD Echelle Observations of the Active RS CVn System II Pegasi. *David P. Huenemoeder and Lawrence W. Ramsey.* **319**, 392, 97-D5 (1987)
- Evolution of Globular Clusters Including a Degenerate Component. *Hyung Mok Lee.* **319**, 772, 103-D13 (1987)
- Dynamical Effects of Successive Mergers on the Evolution of Spherical Stellar Systems. *Hyung Mok Lee.* **319**, 801, 103-F14 (1987)
- Binary System Parameters and the Hibernation Models of Cataclysmic Variables. *Mario Livio and Michael M. Shara.* **319**, 819, 104-A4 (1987)
- An Analysis of the Light Curves of Short-Period RS Canum Venaticorum Stars: Starspots and Fundamental Properties. *E. Budding and M. Zeilik.* **319**, 827, 104-A12 (1987)
- A Dynamical Instability Model for the Period Gap of Cataclysmic Variable Binary Systems. *Ronald E. Taam and P. N. McDermott.* **319**, L83, 107-E8 (1987)
- Direct Infrared Observations of the Very Low Mass Object Gliese 623B. *D. W. McCarthy, Jr. and T. J. Henry.* **319**, L93, 107-F3 (1987)
- The Spectral Evolution of Dwarf Nova Outbursts. *John K. Cannizzo and Scott J. Kenyon.* **319**, 119, 111-E6 (1987)
- Structure of a Possible Circumbinary Disk around T Tauri. *D. A. Weintraub, C. R. Masson, and B. Zuckerman.* **320**, 336, 111-F9 (1987)
- Milliarcsecond Resolution Infrared Observations of Young Stars in Taurus and Ophiuchus. *M. Simon, R. R. Howell, A. J. Longmore, B. A. Wilking, D. M. Peterson, and W.-P. Chen.* **320**, 344, 111-G3 (1987)
- Polarized Radiation from Extended Magnetic Polar Caps. *G. Channugam and J. Frank.* **320**, 746, 118-A1 (1987)
- A New Formulation of the Starspot Model, and the Consequences of Starspot Structure. *J. D. Dorren.* **320**, 756, 118-A11 (1987)
- Rapid Optical Flaring in MXB 1735 - 444 and an Optical Burst from GX 17 + 2. *James N. Inamura, Thomas Y. Steiman-Cameron, and John Middleditch.* **320**, L41, 114-D3 (1987)
- 4U 1820 - 30 as a Potential Test of the Nonsymmetric Gravitational Theory of Moffat. *Timothy P. Krisher.* **320**, L47, 114-D8 (1987)
- The Collapse of Dense Star Clusters to Supermassive Black Holes: Binaries and Gravitational Radiation. *Gerald D. Quinlan and Stuart L. Shapiro.* **321**, 199, 124-D2 (1987)
- Monte Carlo Simulations of Radio Pulsars and Their Progenitors. *R. J. Dewey and J. M. Cordes.* **321**, 780, 133-A14 (1987)
- The Inner Beams of SS 433. *Jonathan D. Romney, Richard T. Schilizzi, István Fejes, and Ralph E. Spencer.* **321**, 822, 133-E3 (1987)
- Chromospheric-Coronal Activity at Saturated Levels. *Osni Vilhu and Frederick M. Walter.* **321**, 958, 135-A8 (1987)
- Synchronization-induced Period Gaps and Ultra-Short Periods in Magnetic Cataclysmic Binaries. *D. Q. Lamb and Fulvio Melia.* **321**, L133, 137-C11 (1987)
- Dynamical Mass Transfer in Cataclysmic Binaries. *Fulvio Melia and D. Q. Lamb.* **321**, L139, 137-D2 (1987)
- A Possible Semisecular Variation in Orbital Period of Binary Pulsar System PSR 1913 + 16 and Lorentz Invariance of Gravity. *K. Nordvedt, Jr.* **322**, 288, 141-A6 (1987)
- An Upper Limit to the Space Density of Short-period Noninteracting Binary White Dwarfs. *Edward L. Robinson and Allen W. Shafter.* **322**, 296, 141-B1 (1987)
- A Flare Event on the Long-Period RS Canum Venaticorum System IM Pegasi. *Derek L. Buzasi, Lawrence W. Ramsey, and David P. Huenemoeder.* **322**, 353, 141-F8 (1987)
- The Evolutionary Status of 4U 1820 - 30. *S. Rappaport, L. A. Nelson, C. P. Ma, and P. C. Joss.* **322**, 842, 149-A12 (1987)
- On Synchronization in Early-Type Binaries. *Jean-Louis Tassoul.* **322**, 856, 149-B12 (1987)
- Polarization Variability among Wolf-Rayet Stars. I. Linear Polarization of a Complete Sample of Southern Galactic WC Stars. *Nicole St-Louis, Laurent Drissen, Anthony F. J. Moffat, Pierre Bastien, and Santiago Tapia.* **322**, 870, 149-C13 (1987)
- Polarization Variability among Wolf-Rayet Stars. II. Linear Polarization as a Complete Sample of Southern Galactic WN Stars. *Laurent Drissen, Nicole St-Louis, Anthony F. J. Moffat, and Pierre Bastien.* **322**, 888, 149-E5 (1987)
- The Discovery of Near-Infrared Polarized Cyclotron Emission in the Intermediate Polar BG Canis Minoris. *Steven C. West, Graham Berriman, and Gary D. Schmidt.* **322**, L35, 145-C7 (1987)
- Degenerate Dwarf Binaries as Promising, Detectable Sources of Gravitational Radiation. *Charles R. Evans, Icko Iben, Jr., and Larry Smarr.* **323**, 129, 154-E1 (1987)
- Three-dimensional Hydrodynamical Simulations of Stellar Collisions. I. Equal-Mass Main-Sequence Stars. *W. Benz and J. G. Hills.* **323**, 614, 161-D9 (1987)
- Discovery of Radio Emission from AE Aquarii. *J. A. Bookbinder and D. Q. Lamb.* **323**, L131, 164-D7 (1987)
- Photometry and Spectroscopy of Short-Period Cataclysmic Variables. *Paula Szkody.* **63**, 685, 11-B3 (1987) (Abstr. in **313**, 930, 26-G13)
- Stellar Multiplicity in the Scorpius-Centaurus Association. *Hugo Levato, Stella Mataroda, Nidia Morrell, and Gladys Solivella.* **64**, 487,

Stars: Binaries—Continued

- 23-B8 (1987) (Abstr. in 315, 731, 48-E12)
 The Kinematical and Binary Properties of Association and Field O Stars. *D. R. Gies*. **64**, 545, 24-G2 (1987) (Abstr. in 317, 1003, 77-B6)
 Atlas of Time-resolved Spectrophotometry of Cataclysmic Variables. *R. Kent Honeycutt, Ronald H. Kaitchuck, and Eric M. Schlegel*. **65**, 451, 34-D4 (1987) (Abstr. in 321, 1052, 136-A3)

Stars: Carbon

- The Formation of a 1.5 M_{\odot} Carbon Star with $M_{bol} = -4.4$. *John C. Lattanzio*. **313**, L15, 21-B3 (1987)
 Ultraviolet Spectra and Chromospheres of Cool Carbon Stars. *Hollis R. Johnson and Donald G. Luttermoser*. **314**, 329, 31-F9 (1987)
 New Lines of Ethylene and a Search for Methylene in IRC +10216. *D. M. Goldhaber, A. L. Betz, and J. J. Ottusch*. **314**, 356, 32-A13 (1987)
 Oxygen Isotopic Abundances in Evolved Stars. III. 26 Carbon Stars. *Michael J. Harris, David L. Lambert, Kenneth H. Hinkle, Bengt Gustafsson, and Kjell Eriksson*. **316**, 294, 53-B14 (1987)
 A Water Maser Associated with EU Andromedae: A Carbon Star Near an Oxygen-rich Circumstellar Shell. *Priscilla J. Benson and Irene R. Little-Marein*. **316**, L37, 56-C13 (1987)
 Carbon ($^{12}\text{C}/^{13}\text{C}$) and Oxygen ($^{16}\text{O}/^{17}\text{O}$) Isotopic Ratios in Seven Evolved Stars. *James F. Dominy and George Wallerstein*. **317**, 810, 74-G11 (1987)
 On the Source of the Violet Depression in Carbon Stars: A Study of the Balmer Decrement in Carbon Long-Period Variables. *Maria Antonietta Orlati*. **317**, 819, 75-A6 (1987)
 A Search for $^{14}\text{C}^{16}\text{O}$ in the Atmospheres of Evolved Stars. *Michael J. Harris and David L. Lambert*. **318**, 868, 90-D12 (1987)
 Abundances in Red Giant Stars: Carbon and Oxygen Isotopes in Carbon-rich Molecular Envelopes. *P. G. Wannier and R. Sahai*. **319**, 367, 97-B2 (1987)
 CO Observations of IRAS Sources with 11.3 Micron Silicon Carbide Dust Features. *D. A. Leahy, Sun Kwok, and R. A. Arquilla*. **320**, 825, 118-F13 (1987)
 Carbon Grains in the Envelope of IRC +10216. *P. G. Martin and C. Rogers*. **322**, 374, 142-A1 (1987)
 Properties of Evolved Mass-losing Stars in the Milky Way and Variations in the Interstellar Dust Composition. *Harley A. Thronson, Jr., William B. Latter, John H. Black, John Bally, and Perry Hacking*. **322**, 770, 148-C5 (1987)
 The Late-Type Stellar Content of NGC 55. *Christopher J. Pritchett, Harvey B. Richer, David Schade, Dennis Crabtree, and H. K. C. Yee*. **323**, 79, 154-A3 (1987)
 Water Maser Emission toward V788 Cygni, A Carbon Star. *Y. Nakada, H. Izumiura, T. Onaka, O. Hashimoto, N. Ukita, S. Deguchi, and T. Tanabé*. **323**, L77, 158-F6 (1987)
 Detection of H^{13}CN Maser Emission from the Ground State toward Y Canum Venaticorum. *Hideyuki Izumiura, Nobuharu Ukita, Ryohei Kawabe, Norio Kaifu, Takashi Tsuji, Wasaburo Umno, and Kouichi Koyama*. **323**, L81, 158-F10 (1987)
 A Flux-limited Sample of Galactic Carbon Stars. *M. J. Claussen, S. G. Kleinmann, R. R. Joyce, and M. Jura*. **65**, 385, 33-F1 (1987) (Abstr. in 321, 1050, 136-A1)

Stars: Catalogs

- A Catalog of Spectroscopically Identified White Dwarfs. *George P. McCook and Edward M. Sion*. **65**, 603, 37-E2 (1987) (Abstr. in 322, 1076, 151-G2)

Stars: Cepheids

- Fourier Coefficients of Variable Stars. II. Light-Curve Analysis. *R. F. Stellingwerf and M. Donohoe*. **314**, 252, 30-G8 (1987)
 Blue Straggler Stars in the Globular Cluster NGC 5466. *James M. Nemec and Hugh C. Harris*. **316**, 172, 51-G7 (1987)
 Spectroscopy and JHK Photometry of Type II Cepheids in the Magellanic Clouds. *Douglas L. Welch*. **317**, 672, 73-D6 (1987)
 Near-Infrared Observations of Cepheids: The Distance to NGC 300. *Barry F. Madore, Douglas L. Welch, C. W. McAlary, and R. A. McLaren*. **320**, 26, 108-C4 (1987)
 Period Doubling Bifurcations and Chaos in W Virginis Models. *J. Robert Buchler and Géza Kovács*. **320**, L57, 114-E3 (1987)
 Distance Moduli and Structure of the Magellanic Clouds from Near-Infrared Photometry of Classical Cepheids. *Douglas L. Welch, Robert A. McLaren, Barry F. Madore, and Christopher W. McAlary*. **321**, 162, 124-A7 (1987)
 Reexamination of the Metal Contribution to Astrophysical Opacity. *C. A. Iglesias, F. J. Rogers, and B. G. Wilson*. **322**, L45, 145-D2 (1987)
 Observational Studies of Cepheids. VI. Period-Radius Relations. *Thomas J. Moffett and Thomas G. Barnes III*. **323**, 280, 156-B5 (1987)
 Observational Studies of Cepheids. V. Radial Velocities of Bright Cepheids. *Thomas G. Barnes III, Thomas J. Moffett, and Mark H. Slovak*. **65**, 307, 32-E1 (1987) (Abstr. in 320, 937, 120-B2)

Stars: Chromospheres

- A Discussion of Epsilon Eridani's Age, Composition, and Oscillation Spectrum. *D. B. Guenther*. **312**, 211, 3-C4 (1987)
 Microwave Observations of Flare Stars UV Ceti, AT Microscopii, and AU Microscopii. *M. R. Kundu, P. D. Jackson, S. M. White, and M. Melozzi*. **312**, 822, 12-A1 (1987)
 X-Ray Sources in Regions of Star Formation. II. The Pre-Main-Sequence G Star HD 283572. *F. M. Walter, A. Brown, J. L. Linsky, A. E. Rydgren, F. Vrba, M. Roth, L. Carrasco, P. F. Chugainov, N. I. Shakovskaya, and C. L. Imhoff*. **314**, 297, 31-D2 (1987)
 Ultraviolet Spectra and Chromospheres of Cool Carbon Stars. *Hollis R. Johnson and Donald G. Luttermoser*. **314**, 329, 31-F9 (1987)
 The Ha Chromosphere of Alpha Orionis. *Jeremy C. Hebben, Andreas Eckart, and E. Keith Hege*. **314**, 690, 37-B10 (1987)
 Objective Characterization of Stellar Activity Cycles. I. Methods and Solar Cycle Analyses. *Ronald L. Gilliland and Sallie L. Baliunas*. **314**, 766, 38-A6 (1987)
 Chromospheric Activity and Ages of Solar-Type Stars. *Don C. Barry, Richard H. Cromwell, and E. Keith Hege*. **315**, 264, 42-G5 (1987)
 Stellar Activity in Synchronized Binaries. II. A Correlation Analysis with Single Stars. *Gibor Basri*. **316**, 377, 54-B9 (1987)
 The Dependence of Ultraviolet Chromospheric Emission upon Rotation among Late-Type Stars. *Theodore Simon and Francis C. Fekel, Jr.*. **316**, 434, 54-G2 (1987)
 Theory of Transition-Layer Emission Measures and Coronae. *Erika Böhm-Vitense*. **317**, 750, 74-C2 (1987)
 "Marginal" BY Draconis Stars. *Bernard W. Bopp*. **317**, 781, 74-E8 (1987)
 Duplicity among Stars with Strong Chromospheric Ca II Emission Lines: A Statistical Survey. *Arthur Young, Richard A. Mielbrecht, and Helmut A. Abt*. **317**, 787, 74-F1 (1987)
 The Atmospheres of T Tauri Stars. I. High-Resolution Calibrated Observations of Moderately Active Stars. *Ulrich Finkenzeller and Gibor Basri*. **318**, 823, 90-A2 (1987)
 An IUE Survey of Activity in Red Giants and Supergiants. *I. Ozonovich and D. M. Gibson*. **319**, 383, 97-C10 (1987)
 Chromospheric-Coronal Activity at Saturated Levels. *Osmi Vilhu and Frederick M. Walter*. **321**, 958, 135-A8 (1987)
 Formation of Chromospheric Lines in Cool Dwarf Stars. *L. E. Cram and M. S. Giampapa*. **323**, 316, 156-D13 (1987)
 Further Observations of the He I 10830 Å Chromospheric Line in Stars. *David L. Lambert*. **65**, 255, 32-A1 (1987) (Abstr. in 320, 936, 120-B1)
- Stars: Circumstellar Shells**
 Infrared Spectroscopy of IRC +10420. *John D. Fix and Michael L. Cobb*. **312**, 290, 4-B1 (1987)
 Emission from CO Band Heads in Young Stellar Objects. *T. R. Geballe and S. E. Persson*. **312**, 297, 4-B8 (1987)
 The Dust Shells of NML Cygnus and IRC 10420: Inner Radius, Temperature, and Optical Thickness: Erratum. *Stephen T. Ridgway, Richard R. Joyce, Dennis Connors, Judith L. Pipher, and Christopher Dainty*. **312**, 963, 13-E1 (1987) (Orig. paper in 302, 662, 37-G8)
 CO in the Circumstellar Envelope of Alpha Orionis. *P. J. Huggins*. **313**, 400, 19-D5 (1987)
 A Model for the Emission from the Bulge of Our Galaxy. *M. Rowan-Robinson and T. Chester*. **313**, 413, 19-E4 (1987)
 Observation of the HH 1 and 2 Region with IRAS. *Steven H. Pravdo and Thomas J. Chester*. **314**, 308, 31-D13 (1987)
 Long Carbon Chain Molecules in Circumstellar Shells. *H. W. Kroto, J. R. Heath, S. C. O'Brien, R. F. Curl, and R. E. Smalley*. **314**, 352, 32-A9 (1987)
 New Lines of Ethylene and a Search for Methylene in IRC +10216. *D. M. Goldhaber, A. L. Betz, and J. J. Ottusch*. **314**, 356, 32-A13 (1987)
 An IRAS Survey of IR Excesses in G-Type Stars. *Sten F. Odenwald*. **314**, 830, 38-F2 (1987) (Orig. paper in 307, 711, 104-F6)
 Detection of H I Emission from the Circumstellar Envelope of Alpha Orionis. *P. F. Bowers and G. R. Knapp*. **315**, 305, 43-C4 (1987)
 Low-Mass, Pre-Main-Sequence Stars: The Infrared Emission from Circumstellar Dust. *M. G. Wolfire and E. Churchwell*. **315**, 315, 43-C14 (1987)
 Infrared Speckle Interferometry and Imaging of Several OH/IR Stars. *Michael L. Cobb and John D. Fix*. **315**, 325, 43-D10 (1987)
 On the Contribution of Interstellar Extinction to the 10 Micron Dust Feature in OH/IR Stars. *Kevin Volk and Sun Kwok*. **315**, 654, 47-G1 (1987)
 SiO Cooling Instability in the Envelopes of Cool Giant Stars. *David O. Muchmore, Joseph A. Nuth III, and Robert E. Stencel*. **315**, L141, 49-F10 (1987)
 A Water Maser Associated with EU Andromedae: A Carbon Star Near an Oxygen-rich Circumstellar Shell. *Priscilla J. Benson and Irene R.*

- Little-Marenin*. **316**, L37, 56-C13 (1987)
- Far-Infrared Detection of a Circumstellar Dust Torus around Sharpless 106. *Paul M. Harvey, Daniel F. Lester, and Marshall Joy*. **316**, L75, 62-C5 (1987)
- Polarization, Jets, and the Distribution of Circumstellar Dust around T Tauri Stars and Other Young Infrared Sources. *Pierre Bastien*. **317**, 231, 66-D12 (1987)
- Study of the H42 α (86 GHz) Recombination Line in W3(OH). *Wm. J. Welch and J. Marr*. **317**, L21, 71-B10 (1987)
- A Hot, Low Mass-Loss Rate Inner Envelope in IRC +10216. *R. Sahai*. **318**, 809, 89-F11 (1987)
- Broad-Band Imaging of the Beta Pictoris Circumstellar Disk. *Francesco Paresce and Christopher Burrows*. **319**, L23, 100-C1 (1987)
- Structure of a Possible Circumbinary Disk around T Tauri. *D. A. Weintraub, C. R. Masson, and B. Zuckerman*. **320**, 336, 111-F9 (1987)
- CO Observations of IRAS Sources with 11.3 Micron Silicon Carbide Dust Features. *D. A. Leahy, Sun Kwok, and R. A. Arquilla*. **320**, 825, 118-F13 (1987)
- Water Masers Associated with Low-Mass Stars: A Survey of the Rho Ophiuchi Infrared Cluster. *B. A. Wilking and M. J. Claussen*. **320**, L133, 121-E4 (1987)
- Forbidden Line and H α Profiles in T Tauri Star Spectra: A Probe of Anisotropic Mass Outflows and Circumstellar Disks. *Suzan Edwards, Sylvie Cabrit, Stephen E. Strom, Ingeborg Heyer, Karen M. Strom, and E. Anderson*. **321**, 473, 127-C10 (1987)
- Solar System-Sized Condensations in the Orion Nebula. *E. Churchwell, M. Felli, D. O. S. Wood, and M. Massi*. **321**, 516, 127-F11 (1987)
- Extinction and Abundance Properties of Alpha Scorpii Circumstellar Grains. *Theodore P. Snow, Jr., Richard H. Buss, Jr., D. P. Gilra, and J. P. Swings*. **321**, 921, 134-E13 (1987)
- Carbon Grains in the Envelope of IRC +10216. *P. G. Martin and C. Rogers*. **322**, 374, 142-A1 (1987)
- Properties of Evolved Mass-losing Stars in the Milky Way and Variations in the Interstellar Dust Composition. *Harley A. Thronson, Jr., William B. Latter, John H. Black, John Bally, and Perry Hacking*. **322**, 770, 148-C5 (1987)
- Kinematics of the Circumstellar Gas of HL Tauri and R Monocerotis. *Anneila I. Sargent and Steven Beckwith*. **323**, 294, 156-C5 (1987)
- Photochemistry and Molecular Ions in Oxygen-rich Circumstellar Envelopes. *G. A. Mamon, A. E. Glassgold, and A. Omont*. **323**, 306, 156-D3 (1987)
- Mass Loss from Evolved Stars. VII. OH Maser Shell Radii and Mass-Loss Rates for OH/IR Stars. *Nathan Netzer and G. R. Knapp*. **323**, 734, 162-F12 (1987)
- High-Excitation SiO Masers in Evolved Stars. *P. R. Jewell, Dale F. Dickinson, L. E. Snyder, and D. P. Clemens*. **323**, 749, 163-A1 (1987)
- H $_2$ O Masers in Circumstellar Envelopes. *Adair P. Lane, K. J. Johnston, P. F. Bowers, J. H. Spencer, and P. J. Diamond*. **323**, 756, 163-A8 (1987)
- Water Maser Emission toward V788 Cygni, A Carbon Star. *Y. Nakada, H. Izumiura, T. Onaka, O. Hashimoto, N. Ukita, S. Deguchi, and T. Tanabé*. **323**, L77, 158-F6 (1987)
- Detection of H 13 CN Maser Emission from the Ground State toward Y Canum Venaticorum. *Hideyuki Izumiura, Nobuharu Ukita, Ryohei Kawabe, Norio Kaifu, Takashi Tsuji, Wasaburo Unno, and Kouichi Koyama*. **323**, L81, 158-F10 (1987)
- Yellow Evolved Stars in Open Clusters. *James R. Sowell*. **64**, 241, 19-D5 (1987) (Abstr. in **315**, 732, 48-E13)
- Stars: Collapsed**
- Nonadiabatic Gravitational Collapse. *A. K. G. de Oliveira and N. O. Santos*. **312**, 640, 10-A1 (1987)
- Mass Accretion on a Collapsed Star. *Amos Harpaz and Nathan Rosen*. **312**, 646, 10-A7 (1987)
- Neutrino Annihilation in Type II Supernovae. *Jeremy Goodman, Arnon Dar, and Shmuel Nussinov*. **314**, L7, 33-B9 (1987)
- Neutrino Flows in Collapsing Stars: A Two-Fluid Model: Erratum. *J. Cooperstein, L. J. van den Horn, and E. A. Baron*. **315**, 729, 48-E10 (1987) (Orig. paper in **309**, 653, 128-D5)
- Neutrinos from Gravitational Collapse. *Ron Mayle, James R. Wilson, and David N. Schramm*. **318**, 288, 82-A11 (1987)
- On the Collapse of 8–10 M_{\odot} Stars Due to Electron Capture. *Shigeki Miyaji and Ken'ichi Nomoto*. **318**, 307, 82-C2 (1987)
- The Effects of Neutrino Transport on the Collapse of Iron Stellar Cores. *E. S. Myra, S. A. Bludman, Y. Hoffman, I. Lichenstadt, N. Sack, and K. A. Van Riper*. **318**, 744, 89-B2 (1987)
- Neutrinos from SN 1987A. *Adam Burrows and James M. Lattimer*. **318**, L63, 92-C8 (1987)
- Late-Time Neutrino Heating and Energetics of Stalled Shocks in Type II Supernovae. *A. Ray and K. Kar*. **319**, 143, 94-E9 (1987)
- Evolution of Globular Clusters Including a Degenerate Component. *Hyung Mok Lee*. **319**, 772, 103-D13 (1987)
- Collapse of 9 M_{\odot} Stars. *E. Baron, J. Cooperstein, and S. Kahana*. **320**, 300, 111-D1 (1987)
- Collapsing White Dwarfs. *E. Baron, J. Cooperstein, S. Kahana, and K. Nomoto*. **320**, 304, 111-D5 (1987)
- A Rigorous Examination of the Chandrasekhar Theory of Stellar Collapse. *Elliott H. Lieb and Horng-Tzer Yau*. **323**, 140, 154-E12 (1987)
- Stars: Combination Spectra**
- A Radio Survey of Symbiotic Stars: Erratum. *E. R. Seaquist, A. R. Taylor, and S. Sutton*. **317**, 555, 70-A5 (1987) (Orig. paper in **284**, 202, 100-C7)
- Stars: Coronae**
- Multipeaked X-Ray Bursts from 4U/MXB 1636 – 53: Evidence for Burst-induced Accretion Disk Coronae. *Fulvio Melia*. **315**, L43, 45-D12 (1987)
- Theory of Transition-Layer Emission Measures and Coronae. *Erika Böhm-Vitense*. **317**, 750, 74-C2 (1987)
- Stars: Diameters**
- Observational Studies of Cepheids. VI. Period-Radius Relations. *Thomas J. Moffett and Thomas G. Barnes III*. **323**, 280, 156-B5 (1987)
- Stars: Dwarf Novae**
- NSV 12615: An Eclipsing Cataclysmic Variable with Ultrashort Period. *F. J. Jablonski and J. E. Steiner*. **313**, 376, 19-A13 (1987)
- Detection of Superhumps and Quasi-periodic Oscillations in the Light Curve of the Dwarf Nova SW Ursae Majoris. *Edward L. Robinson, Allen W. Shafter, J. Allen Hill, Matt A. Wood, and Janet A. Mattel*. **313**, 772, 25-C2 (1987)
- The Evolution of Magnetic Cataclysmic Variables. *J. M. Hameury, A. R. King, J. P. Lasota, and H. Ritter*. **316**, 275, 53-A9 (1987)
- A Linear Thermal Stability Analysis for the Vertical Structure of Alpha Model Accretion Disks. *Hideyuki Saio, John K. Cannizzo, and J. Craig Wheeler*. **316**, 716, 60-A1 (1987)
- Time-resolved Spectrophotometry of the Cataclysmic Variable EX Hydrae. *Ronald H. Kaitchuck, Panayiotis A. Hantzios, Panagiotis Kakaletis, R. Kent Honeycutt, and Eric M. Schlegel*. **317**, 765, 74-D3 (1987)
- Binary System Parameters and the Hibernation Models of Cataclysmic Variables. *Mario Livio and Michael M. Shara*. **319**, 819, 104-A4 (1987)
- The Spectral Evolution of Dwarf Nova Outbursts. *John K. Cannizzo and Scott J. Kenyon*. **320**, 319, 111-E6 (1987)
- Reconnection-driven Oscillations in Dwarf Novae Disks. *T. Tajima and D. Gilden*. **320**, 741, 117-G10 (1987)
- The Eclipses of Cataclysmic Variables. II. U Geminorum. *E.-H. Zhang and Edward L. Robinson*. **321**, 813, 133-D8 (1987)
- The Low-Luminosity X-Ray Sources in Omega Centauri. *Bruce Margon and Michael Bolte*. **321**, L61, 129-F11 (1987)
- IUE Observations of the Dwarf Nova HL Canis Majoris and the Winds of Cataclysmic Variables. *Christopher W. Mauche and John C. Raymond*. **323**, 690, 162-C6 (1987)
- Photometry and Spectroscopy of Short-Period Cataclysmic Variables. *Paula Szkody*. **63**, 685, 11-B3 (1987) (Abstr. in **313**, 930, 26-G13)
- Atlas of Time-resolved Spectrophotometry of Cataclysmic Variables. *R. Kent Honeycutt, Ronald H. Kaitchuck, and Eric M. Schlegel*. **65**, 451, 34-D4 (1987) (Abstr. in **321**, 1052, 136-A3)
- Stars: Early-Type**
- Deep Einstein X-Ray Imagery of the Small Magellanic Cloud. *Frederick C. Bruhweiler, Daniel A. Klinglesmith III, Theodore R. Gull, and Sabatino Sofia*. **317**, 152, 65-E11 (1987)
- Polarization of Light Scattered from the Winds of Early-Type Stars. *J. P. Cassinelli, K. H. Nordsieck, and M. A. Murison*. **317**, 290, 67-B1 (1987)
- Studies of Hot B Subdwarfs. V. Continuing Investigation of the C, N, and Si Abundance Patterns in the Atmospheres of sdB Stars. *R. Lamontagne, F. Wesemael, and G. Fontaine*. **318**, 844, 90-C1 (1987)
- Highly Ionized Stellar Winds in Be Stars: The Evidence for Aspect Dependence. *C. A. Grady, K. S. Bjorkman, and T. P. Snow*. **320**, 376, 112-B8 (1987)
- Time Variability of Gamma Cassiopeiae in X-Rays. *F. Frontera, D. Dal Fiume, N. R. Robba, G. Manzo, S. Re, and E. Costa*. **320**, L127, 121-D13 (1987)
- Further Observations of the Peculiar Hot Helium-rich Degenerate KPD 0005 + 5106. *Ronald A. Downes, Edward M. Sion, James Liebert, and J. B. Holberg*. **321**, 943, 134-G7 (1987)
- On Synchronization in Early-Type Binaries. *Jean-Louis Tassoul*. **322**, 856, 149-B12 (1987)
- Ultraviolet Interstellar Extinction toward NGC 6530 and the Intrinsic Energy Distribution of 9 Sagittarii and HD 165052. *Ana V. Torres*. **322**, 949, 150-C7 (1987)
- Are There Stellar Winds in the Hot Stars of M31? *J. B. Hutchings, Philip Massey, and L. Bianchi*. **322**, L79, 152-B13 (1987)

Stars: Early-Type—Continued

- Recent Massive Star Formation in 30 Doradus. *Nolan R. Walborn and J. Chris Blades*. **323**, L65, 158-E6 (1987)
- The Kinematical and Binary Properties of Association and Field O Stars. *D. R. Gies*. **64**, 545, 24-G2 (1987) (Abstr. in **317**, 1003, 77-B6)
- The Early A Type Stars: Refined MK Classification, Confrontation with Strömgren Photometry, and the Effects of Rotation. *R. O. Gray and R. F. Garrison*. **65**, 581, 37-C1 (1987) (Abstr. in **322**, 1076, 151-G2)

Stars: Eclipsing Binaries

- A New Method to Optimize Parameters in Solutions of Eclipsing Binary Light Curves. *Josef Kallrath and Albert P. Linnell*. **313**, 346, 18-F11 (1987)
- The Problem of V444 Cygni. *A. B. Underhill and R. P. Fahey*. **313**, 358, 18-G9 (1987)
- NSV 12615: An Eclipsing Cataclysmic Variable with Ultrashort Period. *F. J. Jablonski and J. E. Steiner*. **313**, 376, 19-A13 (1987)
- Analysis of the Evolved Contact System V367 Cygni. *Yan-Feng Li and Kam-Ching Leung*. **313**, 801, 25-E3 (1987)
- Two Micron CO Absorption Lines in the Spectrum of Epsilon Aurigae during Eclipse. *Kenneth H. Hinkle and Theodore Simon*. **315**, 296, 43-B9 (1987)
- The Problem of the W-Type Light Curves of W Ursae Majoris. *Albert P. Linnell*. **316**, 389, 54-C8 (1987)
- MR Cygni Revisited. *Albert P. Linnell and Josef Kallrath*. **316**, 754, 60-C12 (1987)
- Detection of a BY Draconis-like Binary Companion to the Contact Binary XY Leonis. *Samuel C. Barden*. **317**, 333, 67-E4 (1987)
- RW Comae Berenices. III. Light Curve Solution and Absolute Parameters. *E. F. Milone, R. E. Wilson, and B. J. Hrivnak*. **319**, 325, 96-E3 (1987)
- V677 Centauri: Overcontact and Completely Eclipsing but A-Type or W-Type? *Pamela M. Kilmartin, David H. Bradstreet, and Robert H. Koch*. **319**, 334, 96-E12 (1987)
- Spectrophotometry of Epsilon Aurigae. *D. T. Thompson, B. L. Lutz, G. W. Lockwood, and J. R. Sowell*. **321**, 450, 127-B1 (1987)
- The Eclipses of Cataclysmic Variables. II. U Geminorum. *E.-H. Zhang and Edward L. Robinson*. **321**, 813, 133-D8 (1987)
- Atmospheric Eclipses in the SMC Wolf-Rayet Eclipsing Binary HD 5980: The Heavy versus the Light Metal Abundance. *G. Koenigsberger, A. F. J. Moffat, and L. H. Auer*. **322**, L41, 145-C12 (1987)
- Magnetic Activity, Tides, and Orbital Period Changes in Close Binaries. *James H. Applegate and Joseph Patterson*. **322**, L99, 152-D4 (1987)
- The Ultraviolet Spectrum of Beta Lyrae. *Paolo A. Mazzali*. **65**, 695, 39-D1 (1987) (Abstr. in **322**, 1077, 151-G3)
- Stars: Emission-Line**
- Velocity Structure of Stellar Atmospheres: R Scuti. *David Mozurkewich, R. D. Gehrz, K. H. Hinkle, and D. L. Lambert*. **314**, 242, 30-F12 (1987)
- Infrared Line Observations of Low-Luminosity Outflow Sources. *Howard A. Smith, J. Fischer, T. R. Geballe, and P. R. Schwartz*. **316**, 265, 52-G12 (1987)
- "Marginal" BY Draconis Stars. *Bernard W. Bopp*. **317**, 781, 74-E8 (1987)
- The Infrared Emission-Line Spectrum of γ Cassiopeiae. *F. Hamann and M. Simon*. **318**, 356, 82-F10 (1987)
- The Atmospheres of T Tauri Stars. I. High-Resolution Calibrated Observations of Moderately Active Stars. *Ulrich Finkenzeller and Gabor Basri*. **318**, 823, 90-A2 (1987)
- An IUE Survey of Activity in Red Giants and Supergiants. I. *Oznovich and D. M. Gibson*. **319**, 383, 97-C10 (1987)
- Spectroscopy of the Rapidly Rotating K Star HD 36705. *O. Vilhu, B. Gustafsson, and B. Edvardsson*. **320**, 850, 119-B5 (1987)
- The Inner Beams of SS 433. *Jonathan D. Romney, Richard T. Schilizzi, István Fejes, and Ralph E. Spencer*. **321**, 822, 133-E3 (1987)
- Near-Infrared H₂ Emission from Herbig-Haro Objects. I. A Survey of Low-Excitation Objects. *Richard D. Schwartz, Martin Cohen, and Peredur M. Williams*. **322**, 403, 142-C2 (1987)
- Effect of Balmer Continuum Absorption on Line Emission from Be Stars. *Krishna M. V. Apparao and S. P. Tarafdar*. **322**, 976, 150-E7 (1987)
- Formation of Chromospheric Lines in Cool Dwarf Stars. *L. E. Cram and M. S. Giampapa*. **323**, 316, 156-D13 (1987)
- Stars: Evolution**
- A Discussion of Epsilon Eridani's Age, Composition, and Oscillation Spectrum. *D. B. Guenther*. **312**, 211, 3-C4 (1987)
- The Wolf-Rayet Population in 30 Doradus and Its Surroundings. *Anthony F. J. Moffat, Virpi S. Niemela, M. M. Phillips, You-hua Chu, and Wilhelm Seggewiss*. **312**, 612, 9-E7 (1987)
- On the Interpretation of the Sandage Period-Shift Effect among Globu-

- lar Cluster RR Lyrae Variables. *Allen V. Sweigart, Alvio Renzini, and Amedeo Tornambè*. **312**, 762, 11-C4 (1987)
- Intermediate-Age Core Helium Burning Stars and the Distance to the Magellanic Clouds. *E. Seidel, G. S. Da Costa, and Pierre Demarque*. **313**, 192, 17-B1 (1987)
- Mass Distribution and Evolutionary Scheme for Central Stars of Planetary Nebulae. *Sara R. Heap and Harry J. Augensen*. **313**, 268, 17-G10 (1987)
- Magnetic Field Evolution in White Dwarfs. *C. E. Wendell, H. M. Van Horn, and D. Sargent*. **313**, 284, 18-A12 (1987)
- Lithium in F Stars of Known Age. *Ann M. Boesgaard and Michael J. Tripicco*. **313**, 389, 19-C8 (1987)
- Hypercharge, Solar Structure, and Stellar Evolution. *Ronald L. Gilliland and Werner Däppen*. **313**, 429, 19-F7 (1987)
- Model Atmospheres for Cooling Neutron Stars. *Roger W. Romani*. **313**, 718, 24-E13 (1987)
- Evolutionary Scenarios for Intermediate-Mass Stars in Close Binaries. *Icko Iben, Jr. and Alexander V. Tutukov*. **313**, 727, 24-F8 (1987)
- Mass-losing Red Giants in Open Clusters. *M. Jura*. **313**, 743, 25-A1 (1987)
- The Formation of a 1.5 M_{\odot} Carbon Star with $M_{\text{bol}} = -4.4$. *John C. Lattanzio*. **313**, L15, 21-B3 (1987)
- The Ellipticities of Globular Clusters and the Cyanogen Problem. *John Norris*. **313**, L65, 27-C7 (1987)
- Chromospheric Activity and Ages of Solar-Type Stars. *Don C. Barry, Richard H. Cromwell, and E. Keith Hege*. **315**, 264, 42-G5 (1987)
- Main-Sequence CCD Photometry of the Globular Cluster NGC 362. *Michael Bolte*. **315**, 469, 45-G6 (1987)
- Einstein Observatory Survey of X-Ray Emission from Solar-Type Stars: The Late F and G Dwarf Stars. *A. Maggio, S. Sciortino, G. S. Vaiana, P. Majer, J. Bookbinder, L. Golub, F. R. Harnden, Jr., and R. Rosner*. **315**, 687, 48-B8 (1987)
- An Independent Method for Determining the Age of the Universe. *D. E. Winget, C. J. Hansen, James Liebert, H. M. Van Horn, G. Fontaine, R. E. Nather, S. O. Kepler, and D. Q. Lamb*. **315**, L77, 49-B1 (1987)
- New Evolutionary Relationships for Magellanic Cloud Planetary Nebulae. *Michael A. Dopita, Stephen J. Meatheringham, Peter R. Wood, B. Louise Webster, David H. Morgan, and Holland C. Ford*. **315**, L107, 49-D2 (1987)
- A Reanalysis of Galactic Primary Nucleosynthesis. *Bruce A. Twarog and J. Craig Wheeler*. **316**, 153, 51-F1 (1987)
- Blue Straggler Stars in the Globular Cluster NGC 5466. *James M. Nemec and Hugh C. Harris*. **316**, 172, 51-G7 (1987)
- Deep CCD Photometry in Globular Clusters. V. M5. *Harvey B. Richer and Gregory G. Fahlman*. **316**, 189, 52-A13 (1987)
- The Evolution of Magnetic Cataclysmic Variables. *J. M. Hameury, A. R. King, J. P. Lasota, and H. Ritter*. **316**, 275, 53-A9 (1987)
- Oxygen Isotopic Abundances in Evolved Stars. III. 26 Carbon Stars. *Michael J. Harris, David L. Lambert, Kenneth H. Hinkle, Bengt Gustafsson, and Kjell Eriksson*. **316**, 294, 53-B14 (1987)
- Evolution and Infrared Spectra of Brown Dwarfs: Erratum. *Jonathan I. Lunine, William B. Hubbard, and Mark S. Marley*. **316**, 473, 55-B13 (1987) (Orig. paper in **310**, 238, 134-F2)
- Evolution and Infrared Spectra of Brown Dwarfs: Erratum. *Jonathan I. Lunine, William B. Hubbard, and Mark S. Marley*. **316**, 473, 55-B13 (1987) (Orig. paper in **310**, 238, 134-F2)
- Carbon-to-Nitrogen Ratios along the Evolutionary Sequence of M67. *Jeffery A. Brown*. **317**, 701, 73-F7 (1987)
- Theoretical Stellar Luminosity Functions and the Ages and Compositions of Globular Clusters. *Stephen J. Ratcliff*. **318**, 196, 81-A13 (1987)
- The Formation and Evolution of Tidal Binary Systems. *Stephen L. W. McMillan, P. N. McDermott, and Ronald E. Taam*. **318**, 261, 81-F11 (1987)
- On the Collapse of 8–10 M_{\odot} Stars Due to Electron Capture. *Shigeki Miyaji and Ken'ichi Nomoto*. **318**, 307, 82-C2 (1987)
- Subluminous Type I Supernovae: Their Theoretical Rate in Our Galaxy and in Ellipticals. *A. Tornambè and F. Matteucci*. **318**, L25, 85-B12 (1987)
- Deflagrating White Dwarfs and the Statistical Properties of Type I Supernovae. *James R. Graham*. **318**, L47, 92-B8 (1987)
- Convection and the Mechanism of Type II Supernovae. *Adam Burrows*. **318**, L57, 92-C3 (1987)
- Neutrinos from SN 1987A. *Adam Burrows and James M. Lattimer*. **318**, L63, 92-C8 (1987)
- The Birthrate and Initial Spin Period of Single Radio Pulsars. *Ramesh Narayan*. **319**, 162, 94-G1 (1987)
- The Core Mass-Radius Relation for Giants: A New Test of Stellar Evolution Theory. *P. C. Joss, S. Rappaport, and W. Lewis*. **319**, 180, 95-A5 (1987)

- BVI* CCD Photometry of 47 Tucanae. *Gonzalo Alcaino and William Liller*. **319**, 304, 96-C9 (1987)
- Deep CCD Photometry of the Globular Cluster NGC 7099. *Michael Bolte*. **319**, 760, 103-D1 (1987)
- Evolution of Globular Clusters Including a Degenerate Component. *Hyung Mok Lee*. **319**, 772, 103-D13 (1987)
- A Comparison between Mass-losing and Standard Solar Models. *Joyce A. Guzik, L. A. Willson, and Wendee M. Brunish*. **319**, 957, 105-D5 (1987)
- The Pleiades Rapid Rotators: Evidence for an Evolutionary Sequence. *R. Paul Butler, Ross D. Cohen, Douglas K. Duncan, and Geoffrey W. Marcy*. **319**, L19, 100-B9 (1987)
- Direct Infrared Observations of the Very Low Mass Object Gliese 623B. *D. W. McCarthy, Jr. and T. J. Henry*. **319**, L93, 107-F3 (1987)
- Angular Diameters and Fluxes of Magellanic Cloud Planetary Nebulae. II. High-Speed Direct Imaging. *P. R. Wood, S. J. Meatheringham, M. A. Dopita, and D. H. Morgan*. **320**, 178, 110-A11 (1987)
- The Spectral Evolution of Dwarf Nova Outbursts. *John K. Cannizzo and Scott J. Kenyon*. **320**, 319, 111-E6 (1987)
- CCD Photometry of Large Magellanic Cloud Clusters. IV. The Metal-rich, Remote Southern Cluster L79. *Mario Mateo and Paul Hodge*. **320**, 626, 116-D14 (1987)
- Evolution of Very Low Mass Stars and Brown Dwarfs. II. The Population II. *Francesca D'Antona*. **320**, 653, 117-A1 (1987)
- The Evolution of Asymptotic Giant Branch Stars in the Magellanic Clouds. III. The Problem of Intermediate-Mass Stars. *Jeremy Mould and Neill Reid*. **321**, 156, 124-A1 (1987)
- The Age of the Large Magellanic Cloud Cluster NGC 2193. *G. S. Da Costa, Christopher R. King, and J. R. Mould*. **321**, 735, 132-E6 (1987)
- Monte Carlo Simulations of Radio Pulsars and Their Progenitors. *R. J. Dewey and J. M. Cordes*. **321**, 780, 133-A14 (1987)
- The Effect of Heating from the Boundary Layer on Accretion Models for Novae and Other Compact Objects. *Giora Shaviv and Summer Starrfield*. **321**, L51, 129-F3 (1987)
- Synchronization-induced Period Gaps and Ultra-Short Periods in Magnetic Cataclysmic Binaries. *D. Q. Lamb and Fulvio Melia*. **321**, L133, 137-C11 (1987)
- Dynamical Mass Transfer in Cataclysmic Binaries. *Fulvio Melia and D. Q. Lamb*. **321**, L139, 137-D2 (1987)
- Globular Cluster Evolution in the Galaxy: A Global View. *David F. Chernoff and Stuart L. Shapiro*. **322**, 113, 139-B9 (1987)
- Evolution of 8–10 M_{\odot} Stars toward Electron Capture Supernovae. II. Collapse of an O + Ne + Mg Core. *Ken'ichi Nomoto*. **322**, 206, 140-B8 (1987)
- The Evolutionary Status of 4U 1820 – 30. *S. Rappaport, L. A. Nelson, C. P. Ma, and P. C. Joss*. **322**, 842, 149-A12 (1987)
- The Period Distribution and Evolution of Short-Period Cataclysmic Variables. *Brian Warner and Mario Livio*. **322**, L95, 152-C14 (1987)
- The Supernova Rate in Shapley-Ames Galaxies. *Sidney van den Bergh, Robert D. McClure, and Robert Evans*. **323**, 44, 153-E4 (1987)
- Degenerate Dwarf Binaries as Promising, Detectable Sources of Gravitational Radiation. *Charles R. Evans, Icko Iben, Jr., and Larry Smarr*. **323**, 129, 154-E1 (1987)
- Evolution of a 0.7 M_{\odot} Red Giant. *Amos Harpaz, Attay Kovetz, and Giora Shaviv*. **323**, 154, 154-F13 (1987)
- The Stellar Populations of Shapley Constellation III. *Neill Reid, Jeremy Mould, and Ian Thompson*. **323**, 433, 159-C11 (1987)
- Theoretical Isochrones for Globular Clusters with Predicted Thuan-Gunn Photometry. *R. A. Bell and Don A. Vandenberg*. **63**, 335, 5-D10 (1987) (Abstr. in **312**, 966, 13-E7)
- The Evolution of Red Clump Stars: Theoretical Sequences. *E. Seidel, P. Demarque, and D. Weinberg*. **63**, 917, 15-B13 (1987) (Abstr. in **314**, 832, 38-F8)
- Theoretical Isochrones for Old, Super-Metal-rich Stars. *Don A. Vandenberg and P. G. Laskarides*. **64**, 103, 18-C9 (1987) (Abstr. in **312**, 965, 13-E6)
- The Evolution of the Magnetic Fields of Ap Stars: Magnetic Observations of Stars in the Scorpius-Centaurus Association. *Ian B. Thompson, Douglas N. Brown, and John D. Landstreet*. **64**, 219, 19-B11 (1987) (Abstr. in **315**, 732, 48-E13)
- Yellow Evolved Stars in Open Clusters. *James R. Sowell*. **64**, 241, 19-D5 (1987) (Abstr. in **315**, 732, 48-E13)
- Evolutionary Sequences for Horizontal-Branch Stars. *Allen V. Sweigart*. **65**, 95, 29-A1 (1987) (Abstr. in **319**, 1012, 106-A10)
- A Flux-limited Sample of Galactic Carbon Stars. *M. J. Claussen, S. G. Kleinmann, R. R. Joyce, and M. Jura*. **65**, 385, 33-F1 (1987) (Abstr. in **321**, 1050, 136-A1)
- Stars: Flare**
- Microwave Observations of Flare Stars UV Ceti, AT Microscopii, and AU Microscopii. *M. R. Kundu, P. D. Jackson, S. M. White, and M. Melozzi*. **312**, 822, 12-A1 (1987)
- Low-Energy X-Ray Observations of the Wolf 630 System. *Hugh M. Johnson*. **316**, 458, 55-A12 (1987)
- Dynamic Spectrum of a Radio Flare on UV Ceti. *Peter D. Jackson, Mukul R. Kundu, and Stephen M. White*. **316**, L85, 62-C14 (1987)
- Evidence from Meteor Patrol Photographs for a Nonastronomical Origin of the Reported Optical Flashes in Perseus. *I. Halliday, P. A. Feldman, and A. T. Blackwell*. **320**, L153, 121-F11 (1987)
- A Flare Event on the Long-Period RS Canum Venaticorum System IM Pegasi. *Derek L. Buzasi, Lawrence W. Ramsey, and David P. Huenemoerder*. **322**, 353, 141-F8 (1987)
- Spectral Energy Distributions of T Tauri Stars: Disk Flaring and Limits on Accretion. *S. J. Kenyon and L. Hartmann*. **323**, 714, 162-E3 (1987)
- Rapid, Low-Level X-Ray Variability in Active Late-Type Dwarfs. *Carol W. Ambruster, Salvatore Sciortino, and L. Golub*. **65**, 273, 32-B4 (1987) (Abstr. in **319**, 1012, 106-A10)
- Stars: Formation**
- Star Formation in Seyfert Galaxies. *J. M. Rodriguez Espinosa, Richard J. Rudy, and Barbara Jones*. **312**, 555, 9-A1 (1987)
- Star Formation Rates in Ring Galaxies from IRAS Observations. *P. N. Appleton and Curtis Struck-Marcell*. **312**, 566, 9-A12 (1987)
- Molecular Gas in the Starburst Nucleus of M82. *K. Y. Lo, K. W. Cheung, C. R. Masson, T. G. Phillips, S. L. Scott, and D. P. Woody*. **312**, 574, 9-B7 (1987)
- IRAS Large-Beam and Ground-Based Small-Beam Measurements of the Unidentified 11.3 and [Ne II] 12.8 Micron Line Fluxes in the Starburst Galaxy M82. *P. D. LeVan and S. D. Price*. **312**, 592, 9-D1 (1987)
- Supercloud Formation by Nonaxisymmetric Gravitational Instabilities in Sheared Magnetic Galaxy Disks. *Bruce G. Elmegreen*. **312**, 626, 9-F10 (1987)
- Line Excess in Low-Luminosity Young Stellar Objects. *Rodger I. Thompson*. **312**, 784, 11-D13 (1987)
- Spectral Evolution of Young Stellar Objects. *Fred C. Adams, Charles J. Lada, and Frank H. Shu*. **312**, 788, 11-E3 (1987)
- The Circumstellar Envelope of W3(OH): NH₃ Observations. *Mark J. Reid, Philip C. Myers, and John H. Bieging*. **312**, 830, 12-A9 (1987)
- Compact Molecular Gas Structure in the Interacting Galaxy Pair Arp 299 (IC 694–NGC 3690). *A. I. Sargent, D. B. Sanders, N. Z. Scoville, and B. T. Soifer*. **312**, L35, 14-B1 (1987)
- The Molecular Cloud Ring in NGC 1068. *Steven T. Myers and N. Z. Scoville*. **312**, L39, 14-B6 (1987)
- The Structure and Dynamics of Bok Globule B335. *Margaret A. Frerking, William D. Langer, and Robert W. Wilson*. **313**, 320, 18-D10 (1987)
- Recombination Spectroscopy of Star-Formation Regions in the Nucleus of M83. *Jean L. Turner, Paul T. P. Ho, and Sara C. Beck*. **313**, 644, 23-G2 (1987)
- Chemical Evolution, Stellar Nucleosynthesis, and A Variable Star Formation Rate. *Keith A. Olive, Friedrich-Karl Thielemann, and James W. Truran*. **313**, 813, 25-F1 (1987)
- Bimodal Star Formation: Constraints from the Solar Neighborhood. *Rosemary F. G. Wyse and J. Silk*. **313**, L11, 21-A13 (1987)
- An Active Star Formation Site in RCW 108. *Steven Straw, A. R. Hyland, Terry J. Jones, Paul M. Harvey, Bruce A. Wilking, and Marshall Joy*. **314**, 283, 31-B12 (1987)
- X-Ray Sources in Regions of Star Formation. II. The Pre-Main-Sequence G Star HDE 283572. *F. M. Walter, A. Brown, J. L. Linsky, A. E. Rydgren, F. Vrba, M. Roth, L. Carrasco, P. F. Chugainov, N. I. Shakovskaya, and C. L. Imhoff*. **314**, 297, 31-D2 (1987)
- Observation of the HH 1 and 2 Region with IRAS. *Steven H. Pravdo and Thomas J. Chester*. **314**, 308, 31-D13 (1987)
- Where Massive Stars Form: Associated Radio H II Regions and CO Clouds in the Northern Milky Way. *W. H. Waller, D. P. Clemens, D. B. Sanders, and N. Z. Scoville*. **314**, 397, 32-E4 (1987)
- Compact Continuum Radio Sources in the Orion Nebula. *Guido Garay, James M. Moran, and Mark J. Reid*. **314**, 535, 35-D2 (1987)
- Observations of SiO toward OMC-1: A New Outflow Source 1:T5 South of Orion-KL? *L. M. Ziurys and P. Friberg*. **314**, L49, 39-B12 (1987)
- Far-Infrared Spectroscopy of Star Formation Regions in M82. *P. B. Duffy, E. F. Erickson, M. R. Haas, and J. R. Houck*. **315**, 68, 40-F6 (1987)
- Angular Momentum in a Turbulent Interstellar Medium. *Robert C. Fleck, Jr.*. **315**, 259, 42-F14 (1987)
- A Near-Infrared Study of the Luminous Merging Galaxies NGC 2623 and Arp 148. *Marshall Joy and Paul M. Harvey*. **315**, 480, 46-A4 (1987)
- Low-Luminosity Embedded Sources and Their Environs. *J. A. Davidson*. **315**, 602, 47-C4 (1987)
- Molecular Abundances in OMC-1: The Chemical Composition of

Stars: Formation—Continued

- Interstellar Molecular Clouds and the Influence of Massive Star Formation. *Geoffrey A. Blake, E. C. Sutton, C. R. Masson, and T. G. Phillips.* **315**, 621, 47-D9 (1987)
- IRAS Observations of Starburst and Nonactive Spiral Galaxies. *Kazuhiro Sekiguchi.* **316**, 145, 51-E6 (1987)
- Chemical Enrichment of Halo Protoclusters with Differing Stellar Mass Functions. *Graeme H. Smith and Robert D. McClure.* **316**, 206, 52-C3 (1987)
- Ionization-regulated Star Formation in Magnetized Molecular Clouds. *Ralph E. Pudritz and Joseph Silk.* **316**, 213, 52-C10 (1987)
- The Observational Appearance of Protostellar Accretion Disks. *J. H. Beall.* **316**, 227, 52-D10 (1987)
- Warm Dense Gas in Luminous Protostellar Regions: A Submillimeter and Far-Infrared CO Line Study. *D. T. Jaffe, A. I. Harris, and R. Genzel.* **316**, 231, 52-E1 (1987)
- Infrared Line Observations of Low-Luminosity Outflow Sources. *Howard A. Smith, J. Fischer, T. R. Geballe, and P. R. Schwartz.* **316**, 265, 52-G12 (1987)
- The Effects of Stimulated Star Formation on the Evolution of the Galaxy. III. The Chemical Evolution of Nonlinear Systems. *Steven N. Shore, Federico Ferrini, and Francesco Palla.* **316**, 663, 59-C14 (1987)
- Star Formation in the Magellanic Irregular Galaxy NGC 4449. *Harley A. Thronson, Jr., Deidre A. Hunter, C. M. Telesco, D. A. Harper, and R. Decher.* **317**, 180, 66-A3 (1987)
- Supershells and Propagating Star Formation. *Richard McCray and Minas Kafatos.* **317**, 190, 66-B1 (1987)
- Thermal Emission from Bok Globules. *Man Hoi Lee and C. Rogers.* **317**, 197, 66-B8 (1987)
- Shock-Front Compression of the Magnetic Field in the Canis Major R1 Star Formation Region. *F. J. Vrba, R. Baierlein, and W. Herbst.* **317**, 207, 66-C4 (1987)
- L1689N: Misalignment between a Bipolar Outflow and a Magnetic Field. *Alwyn Wootten and R. B. Loren.* **317**, 220, 66-D1 (1987)
- Detection of Intense Unidentified Lines in TMC-1. *Norio Kaifu, Hiroko Suzuki, Masatoshi Ohishi, Takeshi Miyaji, Shin-ichi Ishikawa, Takashi Kasuga, Masaki Morimoto, and Shuji Saito.* **317**, L111, 78-E14 (1987)
- Star Formation in X-Ray Cluster Cooling Flows. *Raymond E. White III and Craig L. Sarazin.* **318**, 612, 87-E9 (1987)
- Determining Star Formation Rates in X-Ray Cluster Cooling Flows. *Raymond E. White III and Craig L. Sarazin.* **318**, 621, 87-F5 (1987)
- Numerical Models of Star Formation in X-Ray Cluster Cooling Flows. *Raymond E. White III and Craig L. Sarazin.* **318**, 629, 87-F14 (1987)
- Observations of 1.3 Millimeter Emission from the Centers of Galaxies. *Harley A. Thronson, Jr., Christopher K. Walker, Constance E. Walker, and Philip Maloney.* **318**, 645, 88-A4 (1987)
- OH Outflows in Star-forming Regions. *J. F. Mirabel, A. Ruiz, L. F. Rodriguez, and J. Cantó.* **318**, 729, 89-A1 (1987)
- Protostellar Formation in Rotating Interstellar Clouds. VI. Nonuniform Initial Conditions. *Alan P. Boss.* **319**, 149, 94-F2 (1987)
- Infrared Emission from Young Stars in the Nucleus of M82. *Marshall Joy, Daniel F. Lester, and Paul M. Harvey.* **319**, 314, 96-D5 (1987)
- High-Resolution Images of the L1551 Bipolar Outflow: Evidence for an Expanding, Accelerated Shell. *G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, F. P. Schloerb, K. M. Strom, and G. L. Grasdale.* **319**, 742, 103-B6 (1987)
- The Magnetic Field in Star-forming Large Globules. *Klaus-Werner Hodapp.* **319**, 842, 104-B13 (1987)
- Conditions for the Formation of Massive Stars. *Mark G. Wolfire and Joseph P. Cassinelli.* **319**, 850, 104-C7 (1987)
- Infrared Emission and Star Formation in Early-Type Galaxies. *Harley A. Thronson, Jr. and John Bally.* **319**, L63, 107-D1 (1987)
- Global Properties of Interacting Disk-Type Galaxies. *Howard A. Bushouse.* **320**, 49, 108-E4 (1987)
- The IRAS Bright Galaxy Sample. II. The Sample and Luminosity Function. *B. T. Soifer, D. B. Sanders, B. F. Madore, G. Neugebauer, G. E. Danielson, J. H. Elias, Carol J. Lonsdale, and W. L. Rice.* **320**, 238, 110-F7 (1987)
- Star-forming Loops in the IRAS Sky Images. *P. R. Schwartz.* **320**, 258, 111-A1 (1987)
- Molecular Hydrogen Line Emission in Seyfert Galactic Nuclei. *J. Fischer, T. R. Geballe, Howard A. Smith, M. Simon, and J. W. V. Storey.* **320**, 667, 117-B2 (1987)
- Magnetic Braking in Weakly Ionized Media. *Arieh Königl.* **320**, 726, 117-F6 (1987)
- The Formation of the Exponential Disk in Spiral Galaxies. *D. N. C. Lin and J. E. Pringle.* **320**, L87, 121-B6 (1987)
- A New Cometary Nebula in Cygnus. *Th. Neckel and H. J. Staude.* **320**, L145, 121-F1 (1987)
- A New Ionization Model for Galaxies with Dominant Star-Formation Regions. *Rodger I. Thompson.* **321**, 153, 123-G11 (1987)
- A Survey of IRAS Point Sources in Taurus for High-Velocity Molecular Gas. *Mark H. Heyer, Ronald L. Snell, Paul F. Goldsmith, and Philip C. Myers.* **321**, 370, 126-C3 (1987)
- Far-Infrared Continuum Emission from the Nucleus, Starburst, and Extended Spiral Arms of NGC 1068. *D. F. Lester, M. Joy, P. M. Harvey, A. B. Ellis, Jr., and P. S. Parmar.* **321**, 755, 132-G1 (1987)
- Two Micron Spectroscopy of IRAS Galaxies. *Kimiaki Kawara, Minoru Nishida, and Brooke Gregory.* **321**, L35, 129-D12 (1987)
- The Appearance of Primeval Galaxies. *E. Baron and Simon D. M. White.* **322**, 585, 146-C1 (1987)
- The Crucial Role of Cooling in the Making of Molecular Clouds and Stars. *Joel E. Tohline, Peter H. Bodenheimer, and Dimitris M. Christodoulou.* **322**, 787, 148-D9 (1987)
- Chemical Enrichment of Halo Protoclusters with Differing Stellar Mass Functions: Erratum. *Graeme H. Smith and Robert D. McClure.* **322**, 1074, 151-F12 (1987) (Orig. paper in **316**, 206, 52-C3)
- Near-Infrared Observations of Submillijansky Radio Sources: Evidence for a Population of Starburst Galaxies at Intermediate Redshifts. *Trinh X. Thuan and J. J. Condon.* **322**, L9, 145-A11 (1987)
- Submillimeter and Far-Infrared Spectroscopy of M17 and S106: UV-Heated, Quiescent Molecular Gas? *A. I. Harris, J. Stutzki, R. Genzel, J. B. Lugten, G. J. Stacey, and D. T. Jaffe.* **322**, L49, 145-D6 (1987)
- On the Origin of Dwarf Galaxies. *Joseph Silk, Rosemary F. G. Wyse, and G. A. Shields.* **322**, L59, 152-A9 (1987)
- The Structure of Young Star Clusters in the Large Magellanic Cloud. *Rebecca A. W. Elson, S. Michael Fall, and Kenneth C. Freeman.* **323**, 54, 153-F1 (1987)
- A Study of Clumping in the Cepheus OB 3 Molecular Cloud. *John S. Carr.* **323**, 170, 155-A1 (1987)
- Models of Ring Galaxies. II. Extended Starbursts. *Curtis Struck-Marcell and P. N. Appleton.* **323**, 480, 159-G5 (1987)
- Fragmentation of Rapidly Rotating Gas Clouds. I. A Universal Criterion for Fragmentation. *Izumi Hachisu, Joel E. Tohline, and Yoshiharu Eriguchi.* **323**, 592, 161-C1 (1987)
- Recent Massive Star Formation in 30 Doradus. *Nolan R. Walborn and J. Chris Blades.* **323**, L65, 158-E6 (1987)
- Direct Imaging at 12 Microns of the Star-forming Region W51 IRS 2. *John Bally, John F. Arens, Roger Ball, Robert Becker, and John Lacy.* **323**, L73, 158-F1 (1987)
- An Imaging Study of NGC 1275 and PKS 0745 – 191: Vigorous Star Formation in Cooling Flow Cluster Dominant Galaxies. *W. Romanishin.* **323**, L113, 164-B9 (1987)
- Gravitational Collapse in Molecular Cloud Cores around Ultracompact H II Regions: Two Candidates. *Eric R. Keto, Paul T. P. Ho, and Mark J. Reid.* **323**, L117, 164-C1 (1987)
- Continuum Models for Gas in Disturbed Galaxies. III. Bifurcations and Chaos in a Deterministic Model for Bursts of Star Formation. *Curtis Struck-Marcell and John M. Scalzo.* **64**, 39, 17-D11 (1987) (Abstr. in **315**, 730, 48-E11)
- A Study of the Ground-State Hydroxyl Maser Emission Associated with 11 Regions of Star Formation. *Ralph A. Gaume and Robert L. Mutel.* **65**, 193, 31-A5 (1987) (Abstr. in **320**, 936, 120-B1)
- Stars: High-Velocity**
- The Binary Frequency of High-Velocity Field Dwarfs as Obtained with CCD Measures. *Helmut A. Abt and Daryl W. Willmarth.* **318**, 786, 89-E1 (1987)
- Stars: Horizontal Branch**
- On the Interpretation of the Sandage Period-Shift Effect among Globular Cluster RR Lyrae Variables. *Allen V. Sweigart, Alvio Renzini, and Amedeo Tornambè.* **312**, 762, 11-C4 (1987)
- Intermediate-Age Core Helium Burning Stars and the Distance to the Magellanic Clouds. *E. Seidel, G. S. Da Costa, and Pierre Demarque.* **313**, 192, 17-B1 (1987)
- The Evolution of Red Clump Stars: Theoretical Sequences. *E. Seidel, P. Demarque, and D. Weinberg.* **63**, 917, 15-B13 (1987) (Abstr. in **314**, 832, 38-F8)
- Evolutionary Sequences for Horizontal-Branch Stars. *Allen V. Sweigart.* **65**, 95, 29-A1 (1987) (Abstr. in **319**, 1012, 106-A10)
- Stars: Hydrogen Deficient**
- Further Observations of the Peculiar Hot Helium-rich Degenerate KPD 0005 + 5106. *Ronald A. Downes, Edward M. Sion, James Liebert, and J. B. Holberg.* **321**, 943, 134-G7 (1987)
- Stars: Individual (arranged by Constellation name, by Bright Star number, by Henry Draper number, and by Other Designations)**
- By Constellation Name*
- A Water Maser Associated with EU Andromedae: A Carbon Star Near an Oxygen-rich Circumstellar Shell. *Priscilla J. Benson and Irene R. Little-Marenin.* **316**, L37, 56-C13 (1987)
- First Unambiguous X-Ray Detection of R Aquarii. *R. Viotti, L. Piro, M. Friedjung, and A. Cassatella.* **319**, L7, 100-A10 (1987)

- FY Aquilae and the Gamma-Ray Burst Event of 1979 March 31. *Dieter Hartmann and Richard W. Pogge*. **318**, 363, 82-G4 (1987)
- The Baade-Wesselink Method and the Distances to RR Lyrae Stars. II. The Field Star X Arietis. *Rodney V. Jones, Bruce W. Carney, David W. Latham, and Robert L. Kurucz*. **312**, 254, 3-F5 (1987)
- Multiple Wavelength Microwave Observations of the RS Canum Venaticorum Stars UX Arietis, HR 1099, HR 5110, and II Pegasi. *Robert F. Willson and Kenneth R. Lang*. **312**, 278, 4-A2 (1987)
- Two Micron CO Absorption Lines in the Spectrum of Epsilon Aurigae during Eclipse. *Kenneth H. Hinkle and Theodore Simon*. **315**, 296, 43-B9 (1987)
- Spectrophotometry of Epsilon Aurigae. *D. T. Thompson, B. L. Lutz, G. W. Lockwood, and J. R. Sowell*. **321**, 450, 127-B1 (1987)
- [α Bootis] Evidence for Periodic Radial Velocity Variations in Arcturus. *P. H. Smith, R. S. McMillan, and W. J. Merline*. **317**, L79, 78-C12 (1987)
- [κ^2 Bootis] Discovery of High-Degree Nonradial Oscillations in Rapidly Rotating δ Scuti Stars? *G. A. H. Walker, S. Yang, and G. G. Fahlgman*. **320**, L139, 121-E9 (1987)
- [α Canis Majoris] The Copernicus Ultraviolet Spectral Atlas of Sirius. *John B. Rogerson, Jr.*. **63**, 369, 6-A13 (1987) (Abstr. in **312**, 966, 13-E7)
- IUE Observations of the Dwarf Nova HL Canis Majoris and the Winds of Cataclysmic Variables. *Christopher W. Mauche and John C. Raymond*. **323**, 690, 162-C6 (1987)
- The Discovery of Near-Infrared Polarized Cyclotron Emission in the Intermediate Polar BG Canis Minoris. *Steven C. West, Graham Berriman, and Gary D. Schmidt*. **322**, L35, 145-C7 (1987)
- Detection of H^{13}CN Maser Emission from the Ground State toward Y Canum Venaticorum. *Hideyuki Izumiura, Nobuharu Ukita, Ryohei Kawabe, Norio Kaifu, Takashi Tsuji, Wasaburo Unno, and Kouichi Koyama*. **323**, L81, 158-F10 (1987)
- The Infrared Emission-Line Spectrum of γ Cassiopeiae. *F. Hamann and M. Simon*. **318**, 356, 82-F10 (1987)
- V677 Centauri: Overcontact and Completely Eclipsing but A-Type or W-Type? *Pamela M. Kilmarin, David H. Bradstreet, and Robert H. Koch*. **319**, 334, 96-E12 (1987)
- [V834 Centauri] Absorption Features from the Accretion Column in EI405 - 451. *D. T. Wickramasinghe, I. R. Tuohy, and N. Visvanathan*. **318**, 326, 82-D8 (1987)
- Pioneer 10 Observations of the Beta Cephei Stars Gamma Pegasi and Delta Ceti. *Geraldine J. Peters, H. S. Ogawa, K. S. Judge, and D. L. Judge*. **314**, 261, 31-A3 (1987)
- RW Comae Berenices. III. Light Curve Solution and Absolute Parameters. *E. F. Milone, R. E. Wilson, and B. J. Hrivnak*. **319**, 325, 96-E3 (1987)
- Radio Emission from FK Comae. *V. A. Hughes and B. J. McLean*. **313**, 263, 17-G5 (1987)
- The Discovery of an Infrared Reflection Nebula Surrounding R Coronae Australis IRS 5. *Michael W. Castelaz and John A. Hackwell*. **314**, 317, 31-E9 (1987)
- [MR Cygni] A New Method to Optimize Parameters in Solutions of Eclipsing Binary Light Curves. *Josef Kallrath and Albert P. Linnell*. **313**, 346, 18-F11 (1987)
- MR Cygni Revisited. *Albert P. Linnell and Josef Kallrath*. **316**, 754, 60-C12 (1987)
- Analysis of the Evolved Contact System V367 Cygni. *Yan-Feng Li and Kam-Ching Leung*. **313**, 801, 25-E3 (1987)
- The Problem of V444 Cygni. *A. B. Underhill and R. P. Fahey*. **313**, 358, 18-G9 (1987)
- Water Maser Emission toward V788 Cygni, A Carbon Star. *Y. Nakada, H. Izumiura, T. Onaka, O. Hashimoto, N. Ukita, S. Deguchi, and T. Tanabé*. **323**, L77, 158-F6 (1987)
- [V1057 Cygni] Further Evidence for Disk Accretion in FU Orionis Objects. *L. Hartmann and S. J. Kenyon*. **312**, 243, 3-E8 (1987)
- High Spectral Resolution Infrared Observations of V1057 Cygni. *L. Hartmann and S. J. Kenyon*. **322**, 393, 142-B6 (1987)
- [V1515 Cygni] Mass Loss from FU Orionis Objects. *Ken Crosswell, L. Hartmann, and E. H. Avrett*. **312**, 227, 3-D6 (1987)
- [V1515 Cygni] Further Evidence for Disk Accretion in FU Orionis Objects. *L. Hartmann and S. J. Kenyon*. **312**, 243, 3-E8 (1987)
- The Primary Orbit and Absorption Lines of HDE 226868 (Cygnus X-1). *Z. Ninkov, G. A. H. Walker, and S. Yang*. **321**, 425, 126-G4 (1987)
- The He II $\lambda 4686$ and H α Emission Lines of Cygnus X-1. *Z. Ninkov, G. A. H. Walker, and S. Yang*. **321**, 438, 127-A3 (1987)
- Discovery of 5 Hz Quasi-periodic Oscillations in Cygnus X-2. *J. P. Norris and K. S. Wood*. **312**, 732, 11-A1 (1987)
- The Complex Cross-Spectra of Cygnus X-2 and GX 5-1. *M. van der Klis, G. Hasinger, L. Stella, A. Langmeier, J. van Paradijs, and W. H. G. Lewin*. **319**, L13, 100-B2 (1987)
- Reexamination of the SAS 2 Cygnus X-3 Data. *C. E. Fichtel, D. J. Thompson, and R. C. Lamb*. **319**, 362, 97-A9 (1987)
- Sporadic and Periodic 10-1000 TeV Gamma Rays From Cygnus X-3. *R. M. Baltrusaitis, G. L. Cassiday, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebing, C. P. Lingle, E. C. Loh, P. Sokolsky, P. Sommers, and D. Steck*. **323**, 685, 162-C1 (1987)
- The Baade-Wesselink Method and the Distances to RR Lyrae Stars. III. The Field Star SW Draconis. *Rodney V. Jones, Bruce W. Carney, David W. Latham, and Robert L. Kurucz*. **314**, 605, 36-B10 (1987)
- A Discussion of Epsilon Eridani's Age, Composition, and Oscillation Spectrum. *D. B. Guenther*. **312**, 211, 3-C4 (1987)
- [α Eridani] Discovery of High-Degree Nonradial Oscillations in Rapidly Rotating δ Scuti Stars? *G. A. H. Walker, S. Yang, and G. G. Fahlgman*. **320**, L139, 121-E9 (1987)
- Einstein Observations of EF Eridani (2A 0311 - 227), the Textbook Example of AM Herculis-type Systems. *K. Beuermann, L. Stella, and J. Patterson*. **316**, 360, 54-A6 (1987)
- Deterministic Chaos in Accreting Systems: Analysis of the X-Ray Variability of Hercules X-1. *W. Voges, H. Amannspacher, and H. Scheingraber*. **320**, 794, 118-D10 (1987)
- Spectroscopic Observations of the Symbiotic Binary RW Hydrae. *Scott J. Kenyon and Telmo Fernandez-Castro*. **316**, 427, 54-F9 (1987)
- Time-resolved Spectrophotometry of the Cataclysmic Variable EX Hydrae. *Ronald H. Kaitchuck, Panayiotis A. Hantzios, Panagiotis Kakaletis, R. Kent Honeycutt, and Eric M. Schlegel*. **317**, 765, 74-D3 (1987)
- Detection of a BY Draconis-like Binary Companion to the Contact Binary XY Leonis. *Samuel C. Barden*. **317**, 333, 67-E4 (1987)
- The Ultraviolet Spectrum of Beta Lyrae. *Paolo A. Mazzali*. **65**, 695, 39-D1 (1987) (Abstr. in **322**, 1077, 151-G3)
- [21 Monocerotis] Discovery of High-Degree Nonradial Oscillations in Rapidly Rotating δ Scuti Stars? *G. A. H. Walker, S. Yang, and G. G. Fahlgman*. **320**, L139, 121-E9 (1987)
- Kinematics of the Circumstellar Gas of HL Tauri and R Monocerotis. *Anneela I. Sargent and Steven Beckwith*. **323**, 294, 156-C5 (1987)
- The Local Interstellar Medium. VII. The Local Interstellar Wind and Interstellar Material in Front of the Nearby Star α Ophiuchi. *P. C. Frisch, D. G. York, and J. R. Fowler*. **320**, 842, 119-A10 (1987)
- Comparison of Submillimeter and Ultraviolet Observations of Neutral Carbon toward Zeta Ophiuchi. *Jocelyn Keene, Geoffrey A. Blake, and T. G. Phillips*. **313**, 396, 19-D1 (1987)
- Radio Observations of Carbon Monoxide toward Zeta Ophiuchi: Velocity Structure, Isotopic Abundances, and Physical Properties. *William D. Langer, Alfred E. Glassgold, and Robert W. Wilson*. **322**, 450, 142-G9 (1987)
- Recurrent Episodic Mass Loss in a B2e Star: 66 Ophiuchi, 1982-1985. *C. A. Grady, George Sonneborn, Chi-Chao Wu, and H. F. Henrichs*. **65**, 673, 39-A2 (1987) (Abstr. in **322**, 1077, 151-G3)
- CO in the Circumstellar Envelope of Alpha Orionis. *P. J. Huggins*. **313**, 400, 19-D5 (1987)
- The Ha Chromosphere of Alpha Orionis. *Jeremy C. Hebdon, Andreas Eckart, and E. Keith Hege*. **314**, 690, 37-B10 (1987)
- Detection of H I Emission from the Circumstellar Envelope of Alpha Orionis. *P. F. Bowers and G. R. Knapp*. **315**, 305, 43-C4 (1987)
- Periodic Photospheric and Chromospheric Modulation in Alpha Orionis (Betelgeuse). *A. K. Dupree, S. L. Balunas, E. F. Guinan, L. Hartmann, G. E. Nassiopoulos, and G. Sonneborn*. **317**, L86, 78-D4 (1987)
- An Expanding System of Molecular Clouds Surrounding α Orionis. *Ronald J. Maddalena and Mark Morris*. **323**, 179, 155-A10 (1987)
- Mass Loss from FU Orionis Objects. *Ken Crosswell, L. Hartmann, and E. H. Avrett*. **312**, 227, 3-D6 (1987)
- Further Evidence for Disk Accretion in FU Orionis Objects. *L. Hartmann and S. J. Kenyon*. **312**, 243, 3-E8 (1987)
- Pioneer 10 Observations of the Beta Cephei Stars Gamma Pegasi and Delta Ceti. *Geraldine J. Peters, H. S. Ogawa, K. S. Judge, and D. L. Judge*. **314**, 261, 31-A3 (1987)
- Multiple Wavelength Microwave Observations of the RS Canum Venaticorum Stars UX Arietis, HR 1099, HR 5110, and II Pegasi. *Robert F. Willson and Kenneth R. Lang*. **312**, 278, 4-A2 (1987)
- CCD Echelle Observations of the Active RS CVn System II Pegasi. *David P. Huenemoerder and Lawrence W. Ramsey*. **319**, 392, 97-D5 (1987)
- A Flare Event on the Long-Period RS Canum Venaticorum System IM Pegasi. *Derek L. Buzasi, Lawrence W. Ramsey, and David P. Huenemoerder*. **322**, 353, 141-F8 (1987)
- The Nonradial Oscillations of ϵ Persei. II. Nonlinear Characteristics. *Myron A. Smith, Alexander W. Fullerton, and John R. Percy*. **320**, 768, 118-B10 (1987)
- High-Resolution Ultraviolet Observations of Interstellar Lines toward ξ Persei Observed with the Balloon-borne Ultraviolet Spectrometer.

Stars: Individual—Continued

- Theodore P. Snow, H. J. G. L. M. Lamers, and Charles L. Joseph. **321**, 952, 135-A2 (1987)
- Ultraviolet Observations of Extensive Variability in the Stellar Wind of ξ Persei. Raman K. Prinja, Ian D. Howarth, and Huib F. Henrichs. **317**, 389, 68-B11 (1987)
- Broad-Band Imaging of the Beta Pictoris Circumstellar Disk. Francesco Paresce and Christopher Burrows. **319**, L23, 100-C1 (1987)
- A Detailed Analysis of the Radio Emission from the Symbiotic Star RX Puppis. E. R. Seaquist and A. R. Taylor. **312**, 813, 11-G1 (1987)
- On the Stability of the 13.2 Minute Oscillation of V1223 Sagittarii. F. Jablonski and J. E. Steiner. **323**, 672, 162-B2 (1987)
- Ultraviolet Interstellar Extinction toward NGC 6530 and the Intrinsic Energy Distribution of 9 Sagittarii and HD 165052. Ana V. Torres. **322**, 949, 150-C7 (1987)
- Extinction and Abundance Properties of Alpha Scorpii Circumstellar Grains. Theodore P. Snow, Jr., Richard H. Buss, Jr., D. P. Gilra, and J. P. Swings. **321**, 921, 134-E13 (1987)
- Identification of Lines in the Satellite Ultraviolet: The Spectrum of Tau Scorpii. Charles R. Cowley and Donald R. Merritt. **321**, 553, 128-B10 (1987)
- Search for Orbital X-Ray Variation in Scorpius X-1. W. C. Priedhorsky and S. S. Holt. **312**, 743, 11-A13 (1987)
- Intensity and Source State Dependence of the Quasi-periodic Oscillations in Scorpius X-1. M. van der Klis, L. Stella, N. White, F. Jansen, and A. N. Parmar. **316**, 411, 54-F3 (1987)
- Search for X-Ray Emission from the Radio Lobes of Scorpius X-1. Barry Geldzahler and Paul Hertz. **322**, 342, 141-E5 (1987)
- Velocity Structure of Stellar Atmospheres: R Scuti. David Mozurkewich, R. D. Gehrz, K. H. Hinkle, and D. L. Lambert. **314**, 242, 30-F12 (1987)
- Structure of a Possible Circumbinary Disk around T Tauri. D. A. Weintraub, C. R. Masson, and B. Zuckerman. **320**, 336, 111-F9 (1987)
- Kinematics of the Circumstellar Gas of HL Tauri and R Monocerotis. Annela I. Sargent and Steven Beckwith. **323**, 294, 156-C5 (1987)
- [ν Ursae Majoris] Discovery of High-Degree Nonradial Oscillations in Rapidly Rotating δ Scuti Stars? G. A. H. Walker, S. Yang, and G. G. Fahlgren. **320**, L139, 121-E9 (1987)
- BE Ursae Majoris: A Detached Binary with a Unique Reprocessing Spectrum. Donald H. Ferguson, James Liebert, Roc Cutri, Richard F. Green, S. P. Willner, João E. Steiner, and Susan Tokarz. **316**, 399, 54-D4 (1987)
- Detection of Superhumps and Quasi-periodic Oscillations in the Light Curve of the Dwarf Nova SW Ursae Majoris. Edward L. Robinson, Allen W. Shafter, J. Allen Hill, Matt A. Wood, and Janet A. Mattei. **313**, 772, 25-C2 (1987)
- Apsidal Advance in Vela X-1. J. E. Deeter, P. E. Boynton, F. K. Lamb, and G. Zylstra. **314**, 634, 36-E1 (1987)
- Spectroscopy of the Optical Photosphere of the Hot Pulsating Star BW Vulpeculae. Ingemar Furenlid, Arthur Young, Thomas Meylan, Chester Haag, and Greg Crinklaw. **319**, 264, 95-G9 (1987)
- By Bright Star Number
- Multiple Wavelength Microwave Observations of the RS Canum Venaticorum Stars UX Arietis, HR 1099, HR 5110, and II Pegasi. Robert F. Willson and Kenneth R. Lang. **312**, 278, 4-A2 (1987)
- Multiple Wavelength Microwave Observations of the RS Canum Venaticorum Stars UX Arietis, HR 1099, HR 5110, and II Pegasi. Robert F. Willson and Kenneth R. Lang. **312**, 278, 4-A2 (1987)
- By Henry Draper Number
- Spectroscopy of the Rapidly Rotating K Star HD 36705. O. Vilhu, B. Gustafsson, and B. Edvardsson. **320**, 850, 119-B5 (1987)
- [HD 39576] Discovery of Three New RS Canum Venaticorum-like Counterparts to HEAO 1 X-Ray Sources. D. A. H. Buckley, I. R. Tuohy, R. A. Remillard, H. V. Bradt, and D. A. Schwartz. **315**, 273, 42-G14 (1987)
- Nitrogen and Sulfur Overabundances in the Population II Supergiant HD 46703. Howard E. Bond and R. Earle Luck. **312**, 203, 5-B10 (1987)
- [HD 50896] Modeling the Extended Atmospheres of WN Stars. D. J. Hillier. **63**, 947, 15-F8 (1987) (Abstr. in **314**, 833, 38-F9)
- An Empirical Model for the Wolf-Rayet Star HD 50896. D. J. Hillier. **63**, 965, 15-G12 (1987) (Abstr. in **314**, 833, 38-F9)
- The Rich p -Mode Spectrum of the Rapidly Oscillating Peculiar A Star HD 60435. Jaymie M. Matthews, Donald W. Kurtz, and William H. Wehlau. **313**, 782, 25-C12 (1987)
- [HD 113816] Discovery of Three New RS Canum Venaticorum-like Counterparts to HEAO 1 X-Ray Sources. D. A. H. Buckley, I. R. Tuohy, R. A. Remillard, H. V. Bradt, and D. A. Schwartz. **315**, 273, 42-G14 (1987)
- [HD 146413] Discovery of Three New RS Canum Venaticorum-like Counterparts to HEAO 1 X-Ray Sources. D. A. H. Buckley, I. R. Tuohy, R. A. Remillard, H. V. Bradt, and D. A. Schwartz. **315**, 273, 42-G14 (1987)
- Ultraviolet Interstellar Extinction toward NGC 6530 and the Intrinsic Energy Distribution of 9 Sagittarii and HD 165052. Ana V. Torres. **322**, 949, 150-C7 (1987)
- An Eight-Year Spectroscopic Orbit for the WC7 + O4 Wolf-Rayet Binary HD 193793: Toward Solving the Mystery of the Infrared Outbursts. Anthony F. Moffat, Robert Lamontagne, Peredur M. Williams, Jiri Horn, and Wilhelm Seggewiss. **312**, 807, 11-F8 (1987)
- The Primary Orbit and Absorption Lines of HDE 226868 (Cygnus X-1). Z. Ninkov, G. A. H. Walker, and S. Yang. **321**, 425, 126-G4 (1987)
- [HDE 226868] The He II λ 4686 and H α Emission Lines of Cygnus X-1. Z. Ninkov, G. A. H. Walker, and S. Yang. **321**, 438, 127-A3 (1987)
- X-Ray Sources in Regions of Star Formation. II. The Pre-Main-Sequence G Star HDE 283572. F. M. Walter, A. Brown, J. L. Linsky, A. E. Rydgren, F. Vrba, M. Roth, L. Carrasco, P. F. Chugainov, N. I. Shakovskaya, and C. L. Imhoff. **314**, 297, 31-D2 (1987)
- By Other Designations: Names
- Low-Energy X-Ray Observations of the Wolf 630 System. Hugh M. Johnson. **316**, 458, 55-A12 (1987)
- By Other Designations: Alphanumeric
- Correlation between Spectral State and Quasi-periodic Oscillation Parameters in GX 5-1. M. van der Klis, F. Jansen, J. van Paradijs, W. H. G. Lewin, M. Sztajno, and J. Trümper. **313**, L19, 21-B7 (1987)
- The Complex Cross-Spectra of Cygnus X-2 and GX 5-1. M. van der Klis, G. Hasinger, L. Stella, A. Langmeier, J. van Paradijs, and W. H. G. Lewin. **319**, L13, 100-B2 (1987)
- Compact X-Ray Binaries in Hierarchical Triples. I. Tidal Angular Momentum Loss and GX 17 + 2. Charles D. Bailyn and Jonathan E. Grindlay. **312**, 748, 11-B4 (1987)
- The High-Energy X-Ray Spectrum of Black Hole Candidate GX 339 - 4 during a Transition. J. F. Dolan, C. J. Crannell, B. R. Dennis, and L. E. Orwig. **322**, 324, 141-D1 (1987)
- New Lines of Ethylene and a Search for Methylene in IRC +10216. D. M. Goldhaber, A. L. Betz, and J. J. Ottusch. **314**, 356, 32-A13 (1987)
- A Hot, Low Mass-Loss Rate Inner Envelope in IRC +10216. R. Sahai. **318**, 809, 89-F11 (1987)
- Carbon Grains in the Envelope of IRC +10216. P. G. Martin and C. Rogers. **322**, 374, 142-A1 (1987)
- Further Observations of the Peculiar Hot Helium-rich Degenerate KPD 0005 + 5106. Ronald A. Downes, Edward M. Sion, James Liebert, and J. B. Holberg. **321**, 943, 134-G7 (1987)
- NSV 12615: An Eclipsing Cataclysmic Variable with Ultrashort Period. F. J. Jablonski and J. E. Steiner. **313**, 376, 19-A13 (1987)
- Detection of an Extremely Faint Emission Nebula Surrounding the Hot White Dwarf PG 0108 + 101. R. J. Reynolds. **315**, 234, 42-E3 (1987)
- PG 0122 + 200: A New Member of the GW Virginis (PG 1159 - 035) Class of Extremely Hot Pulsating White Dwarfs. Howard E. Bond and Albert D. Grauer. **321**, L123, 137-C1 (1987)
- The Rotationally Modulated Zeeman Spectrum at Nearly 10^9 Gauss of the White Dwarf PG 1031 + 234. William B. Latter, Gary D. Schmidt, and Richard F. Green. **320**, 308, 111-D9 (1987)
- Two Extreme Examples of Compact Pulsators: PG 1115 + 158 and PG 1351 + 489. D. E. Winget, R. E. Nather, and J. Allen Hill. **316**, 305, 53-C11 (1987)
- The Exotic Helium Variable PG 1346 + 082. M. A. Wood, D. E. Winget, R. E. Nather, Frederic V. Hessman, James Liebert, Donald W. Kurtz, F. Wesemael, and G. Wegner. **313**, 757, 25-B1 (1987)
- Two Extreme Examples of Compact Pulsators: PG 1115 + 158 and PG 1351 + 489. D. E. Winget, R. E. Nather, and J. Allen Hill. **316**, 305, 53-C11 (1987)
- Supernova Theory and Supernova 1987A. W. David Arnett. **319**, 136, 94-E1 (1987)
- [SS 433] An Instability of Radiative Acceleration. J. I. Katz. **317**, 264, 66-G3 (1987)
- Photometry of SS 433 over 7 Years: Study of Two Periodicities. Tsevi Mazeh, James C. Kemp, Elia M. Leibowitz, Herbert Meninger, and Haim Mendelson. **317**, 824, 75-A13 (1987)
- The Inner Beams of SS 433. Jonathan D. Romney, Richard T. Schilizzi, István Fejes, and Ralph E. Spencer. **321**, 822, 133-E3 (1987)
- Direct Infrared Imaging of VB 8. M. F. Skrutskie, W. J. Forrest, and M. A. Shure. **312**, L55, 14-C11 (1987)
- The Optical Light Curve of the Low-Mass X-Ray Binary XB 1254 - 690. Christian Motch, Holger Pedersen, Klaus Beuermann, Manfred W. Pakull, and Thierry J.-L. Courvoisier. **313**, 792, 25-D8 (1987)
- 1E 1048.5 + 5421: A New 114 Minute AM Herculis Binary. Simon L. Morris, Gary D. Schmidt, James Liebert, John Stocke, Isabella M.

- Gioia, and Tommaso Maccacaro. 314, 641, 36-E8 (1987)
- Einstein Observations of EF Eridani (2A 0311 - 227), the Textbook Example of AM Herculis-type Systems. K. Beuermann, L. Stella, and J. Patterson. 316, 360, 54-A6 (1987)
- EXOSAT Observations of Double-peaked Bursts with Radius Expansion from 4U/MXB 1820 - 30. F. Haberl, L. Stella, N. E. White, W. C. Priedhorsky, and M. Gottwald. 314, 266, 31-A9 (1987)
- EXOSAT Observations of 4U 1705 - 44: Type I Bursts and Persistent Emission. A. Langmeier, M. Sztajno, G. Hasinger, J. Trümper, and M. Gottwald. 323, 288, 156-B13 (1987)
- A 9.3 Hour Orbital Period in the Potential Black Hole Binary 4U 1957 + 11. John R. Thorstensen. 312, 739, 11-A9 (1987)
- Stars: Interiors**
- An Improved Henyey Method for Calculating Stellar Models. Kent G. Budge. 312, 217, 3-C10 (1987)
- Numerical Implementation of a Perturbation Theory Up to Third Order for Rotating Polytropic Stars: Structure Parameters under Differential Rotation. V. S. Geroynannis and F. N. Valvi. 312, 219, 3-C12 (1987)
- Cooling of Neutron Stars: Effects of the Finite Time Scale of Thermal Conduction. Ken'ichi Nomoto and Sachiko Tsuruta. 312, 711, 10-F4 (1987)
- On the Interpretation of the Sandage Period-Shift Effect among Globular Cluster RR Lyrae Variables. Allen V. Sweigart, Aloio Renzini, and Amedeo Tornambè. 312, 762, 11-C4 (1987)
- The Dynamical Oscillation and Propulsion of Magnetic Fields in the Convective Zone of a Star. I. General Considerations. E. N. Parker. 312, 868, 12-D6 (1987)
- Mass Distribution and Evolutionary Scheme for Central Stars of Planetary Nebulae. Sara R. Heap and Harry J. Augensen. 313, 268, 17-G10 (1987)
- Magnetic Field Evolution in White Dwarfs. C. E. Wendell, H. M. Van Horn, and D. Sargent. 313, 284, 18-A12 (1987)
- A New Estimate of the Mixing Length and Convective Overshooting in Massive Stars. Lawrence D. Cloutman. 313, 699, 24-D8 (1987)
- Maxwellian-averaged Neutron Capture Cross Sections for ^{99}Tc and $^{95-98}\text{Mo}$. R. R. Winters and R. L. Macklin. 313, 808, 25-E10 (1987)
- The Formation of a 1.5 M_{\odot} Carbon Star with $M_{\text{hel}} = -4.4$. John C. Lattanzio. 313, L15, 21-B3 (1987)
- A New Driving Mechanism for Stellar Pulsations. W. Dean Pesnell. 314, 598, 36-B3 (1987)
- Thermal Evolution of Accreting Neutron Stars. II. Long X-Ray Bursts as a Probe Into the Interior. Masayuki Y. Fujimoto, Tomoyuki Hanawa, Icko Iben, Jr., and Martin B. Richardson. 315, 198, 42-B9 (1987)
- Neutron Capture Nucleosynthesis during Core Helium Burning in Massive Stars. N. Prantzos, M. Arnould, and J.-P. Arcoragi. 315, 209, 42-C6 (1987)
- Off-Center Ignition of Nuclear Burning in Merging White Dwarfs. Yasushi Kawai, Hideyuki Saio, and Ken'ichi Nomoto. 315, 229, 42-D12 (1987)
- Linear and Nonlinear Dynamic Instability of Rotating Polytropes. Harold A. Williams and Joel E. Tohline. 315, 594, 47-B10 (1987)
- Neutrino Flows in Collapsing Stars: A Two-Fluid Model: Erratum. J. Cooperstein, L. J. van den Horn, and E. A. Baron. 315, 729, 48-E10 (1987) (Orig. paper in 309, 653, 128-D5)
- Neutrino Emission Processes in Hyperon-populated Neutron Stars. Oren V. Maxwell. 316, 691, 59-E14 (1987)
- Models for Type Ia Supernovae with Composition Inversions. J. Craig Wheeler, Douglas Swartz, Zong-wei Li, and Peter G. Sutherland. 316, 733, 60-B5 (1987)
- Pulsations of White Dwarf Stars with Thick Hydrogen or Helium Surface Layers. Arthur N. Cox, Sumner G. Starrfeld, Russell B. Kidman, and W. Dean Pesnell. 317, 303, 67-B14 (1987)
- Carbon-to-Nitrogen Ratios along the Evolutionary Sequence of M67. Jeffery A. Brown. 317, 701, 73-F7 (1987)
- On Interacting Helium Star-White Dwarf Pairs as Supernova Precursors. Icko Iben, Jr., Ken'ichi Nomoto, Amedeo Tornambè, and Alexander V. Tutukov. 317, 717, 73-G11 (1987)
- The Core Helium Flash and Surface Abundance Anomalies. Robert G. Desupree and Richard K. Wallace. 317, 724, 74-A4 (1987)
- Theoretical Stellar Luminosity Functions and the Ages and Compositions of Globular Clusters. Stephen J. Ratcliff. 318, 196, 81-A13 (1987)
- On the Collapse of 8-10 M_{\odot} Stars Due to Electron Capture. Shigeki Miyaji and Ken'ichi Nomoto. 318, 307, 82-C2 (1987)
- The Effects of Neutrino Transport on the Collapse of Iron Stellar Cores. E. S. Myra, S. A. Bludman, Y. Hoffman, I. Lichenstadt, N. Sack, and K. A. Van Riper. 318, 744, 89-B2 (1987)
- Supernova Theory and Supernova 1987A. W. David Arnett. 319, 136, 94-E1 (1987)
- The Core Mass-Radius Relation for Giants: A New Test of Stellar Evolution Theory. P. C. Joss, S. Rappaport, and W. Lewis. 319, 180, 95-A5 (1987)
- Lower Bounds on the Masses of Rapidly Rotating White Dwarfs. G. Channugam, Meenakshi Rao, and Joel E. Tohline. 319, 188, 95-A13 (1987)
- Effect of Ion Correlations on Free-Free Opacities. N. R. Dugdeviren and S. E. Koonin. 319, 192, 95-B3 (1987)
- Conditions for the Formation of Massive Stars. Mark G. Wolfire and Joseph P. Cassinelli. 319, 850, 104-C7 (1987)
- Collapse of 9 M_{\odot} Stars. E. Baron, J. Cooperstein, and S. Kahana. 320, 300, 111-D1 (1987)
- Evolution of Very Low Mass Stars and Brown Dwarfs. II. The Population II. Francesca D'Antona. 320, 653, 117-A1 (1987)
- On the Origin of the Solar System s-Process Abundances. Robert A. Malaney and Arnold I. Boothroyd. 320, 866, 119-C7 (1987)
- The s-Process Nucleosynthesis of Barium Stars. Robert A. Malaney. 321, 832, 133-E13 (1987)
- The Dynamical Oscillation and Propulsion of Magnetic Fields in the Convective Zone of a Star. II. Thermal Shadows. E. N. Parker. 321, 984, 135-C6 (1987)
- The Dynamical Oscillation and Propulsion of Magnetic Fields in the Convective Zone of a Star. III. Accumulation of Heat and the Onset of the Reyleigh-Taylor Instability. E. N. Parker. 321, 1009, 135-E3 (1987)
- Evolution of 8-10 M_{\odot} Stars toward Electron Capture Supernovae. II. Collapse of an O + Ne + Mg Core. Ken'ichi Nomoto. 322, 206, 140-B8 (1987)
- Selective Mass Loss, Abundance Anomalies, and Helium-rich Stars. G. Michaud, J. Dupuis, G. Fontaine, and T. Montmerle. 322, 302, 141-B7 (1987)
- Resonant Neutrino Oscillations and Stellar Collapse. G. M. Fuller, R. W. Mayle, J. R. Wilson, and D. N. Schramm. 322, 795, 148-E3 (1987)
- On Synchronization in Early-Type Binaries. Jean-Louis Tassoul. 322, 856, 149-B12 (1987)
- A Rigorous Examination of the Chandrasekhar Theory of Stellar Collapse. Elliott H. Lieb and Horng-Tzer Yau. 323, 140, 154-E12 (1987)
- Evolution of a 0.7 M_{\odot} Red Giant. Amos Harpaz, Attay Kovetz, and Giora Shaviv. 323, 154, 154-F13 (1987)
- Theoretical Isochrones for Globular Clusters with Predicted Thuan-Gunn Photometry. R. A. Bell and Don A. Vandenberg. 323, 335, 5-D10 (1987) (Abstr. in 312, 966, 13-E7)
- The Evolution of Red Clump Stars: Theoretical Sequences. E. Seidel, P. Demarque, and D. Weinberg. 323, 917, 15-B13 (1987) (Abstr. in 314, 832, 38-F8)
- Theoretical Isochrones for Old, Super-Metal-rich Stars. Don A. Vandenberg and P. G. Laskarides. 324, 103, 18-C9 (1987) (Abstr. in 312, 965, 13-E6)
- Evolutionary Sequences for Horizontal-Branch Stars. Allen V. Sweigart. 325, 95, 29-A1 (1987) (Abstr. in 319, 1012, 106-A10)
- Asymptotic Approximations for Higher Order Nonradial Oscillations of a Spherically Symmetric Star. P. Smeyers and M. Tassoul. 325, 429, 34-B11 (1987) (Abstr. in 321, 1051, 136-A2)
- Stars: Late-Type**
- A Discussion of Epsilon Eridani's Age, Composition, and Oscillation Spectrum. D. B. Guenther. 312, 211, 3-C4 (1987)
- Infrared Continuum Radiation from Red Giants. William K. Rose. 312, 284, 4-A9 (1987)
- Ground-based Observations of IRAS Candidates for Late Asymptotic Giant Branch Stars. Sun Kwok, Bruce J. Hrivnak, and R. T. Boreiko. 312, 303, 4-B14 (1987)
- On the Binary Nature of Van Biesbroeck 8. C. Perrier and J.-M. Mariotti. 312, L27, 7-B12 (1987)
- Pumping the Stellar Hydroxyl Maser. Dale F. Dickinson. 313, 408, 19-D13 (1987)
- Mass-losing Red Giants in Open Clusters. M. Jura. 313, 743, 25-A1 (1987)
- Maxwellian-averaged Neutron Capture Cross Sections for ^{99}Tc and $^{95-98}\text{Mo}$. R. R. Winters and R. L. Macklin. 313, 808, 25-E10 (1987)
- The Formation of a 1.5 M_{\odot} Carbon Star with $M_{\text{hel}} = -4.4$. John C. Lattanzio. 313, L15, 21-B3 (1987)
- The Incidence of Close Binaries among Stars of Low Mass: Astrophysical Binaries. Arthur Young, Sina Sadjadi, and Eugene Harlan. 314, 272, 31-B1 (1987)
- Objective Characterization of Stellar Activity Cycles. I. Methods and Solar Cycle Analyses. Ronald L. Gilliland and Sallie L. Balunas. 314, 766, 38-A6 (1987)
- SiO Cooling Instability in the Envelopes of Cool Giant Stars. David O. Muchmore, Joseph A. Nuth III, and Robert E. Stencel. 315, L141, 49-F10 (1987)

Stars: Late-Type -Continued

- Emission and Infrared Spectra of Brown Dwarfs: Erratum. *Jonathan I. Lunine, William B. Hubbard, and Mark S. Marley*. **316**, 473, 55-B13 (1987) (Orig. paper in **310**, 238, 134-F2)
- "Marginal" BY Draconis Stars. *Bernard W. Bopp*. **317**, 781, 74-E8 (1987)
- Radial Velocities of Late-Type Stars in the Galactic Center. *K. Seligren, D. N. B. Hall, S. G. Kleinmann, and N. Z. Scoville*. **317**, 881, 75-F5 (1987)
- Evidence for Periodic Radial Velocity Variations in Arcturus. *P. H. Smith, R. S. McMillan, and W. J. Merline*. **317**, L79, 78-C12 (1987)
- The Red/Infrared Evolution in Galaxies—Effects of the Stars on the Asymptotic Giant Branch. *Arati Chokshi and Edward L. Wright*. **319**, 44, 93-E1 (1987)
- The Core Mass–Radius Relation for Giants: A New Test of Stellar Evolution Theory. *P. C. Joss, S. Rappaport, and W. Lewis*. **319**, 180, 95-A5 (1987)
- Abundances in Red Giant Stars: Carbon and Oxygen Isotopes in Carbon-rich Molecular Envelopes. *P. G. Wannier and R. Sahai*. **319**, 367, 97-B2 (1987)
- An IUE Survey of Activity in Red Giants and Supergiants. *I. Ozonich and D. M. Gibson*. **319**, 383, 97-C10 (1987)
- Direct Infrared Observations of the Very Low Mass Object Gliese 623B. *D. W. McCarthy, Jr. and T. J. Henry*. **319**, L93, 107-F3 (1987)
- M Giants in Baade's Window: Infrared Colors, Luminosities, and Implications for the Stellar Content of E and S0 Galaxies. *Jay A. Frogel and A. E. Whitford*. **320**, 199, 110-C10 (1987)
- Spectroscopy of the Rapidly Rotating K Star HD 36705. *O. Vilhu, B. Gustafsson, and B. Edvardsson*. **320**, 850, 119-B5 (1987)
- Rotational Velocities of Low-Mass Stars in the Hyades. *John R. Stauffer, Lee W. Hartmann, and David W. Latham*. **320**, L51, 114-D12 (1987)
- The Evolution of Asymptotic Giant Branch Stars in the Magellanic Clouds. III. The Problem of Intermediate-Mass Stars. *Jeremy Mould and Neill Reid*. **321**, 156, 124-A1 (1987)
- Ground-based Infrared Observations of Variable IRAS Sources as Candidates for Late Asymptotic Giant Branch Stars. *Sun Kwok, Bruce J. Hrivnak, and R. T. Boreiko*. **321**, 975, 135-B11 (1987)
- The "Alternative X" Question: What Causes the Strong Molecular Bands and Damping Lines in the Very Strong Lined (Super-Metal-rich) Stars? *Benjamin J. Taylor and Scott B. Johnson*. **322**, 930, 150-B2 (1987)
- The Late-Type Stellar Content of NGC 55. *Christopher J. Pritchett, Harvey B. Richer, David Schade, Dennis Crabtree, and H. K. C. Yee*. **323**, 79, 154-A3 (1987)
- Evolution of a 0.7 M_{\odot} Red Giant. *Amos Harpaz, Attay Kovetz, and Giora Shaviv*. **323**, 154, 154-F13 (1987)
- Photochemistry and Molecular Ions in Oxygen-rich Circumstellar Envelopes. *G. A. Mamon, A. E. Glassgold, and A. Omont*. **323**, 306, 156-D3 (1987)
- Formation of Chromospheric Lines in Cool Dwarf Stars. *L. E. Cram and M. S. Giampapa*. **323**, 316, 156-D13 (1987)
- Mass Loss from Evolved Stars. VII. OH Maser Shell Radii and Mass-Loss Rates for OH/IR Stars. *Nathan Netzer and G. R. Knapp*. **323**, 734, 162-F12 (1987)
- Theoretical Isochrones for Old, Super-Metal-rich Stars. *Don A. Vandenberg and P. G. Laskarides*. **64**, 103, 18-C9 (1987) (Abstr. in **312**, 965, 13-E6)
- Rapid, Low-Level X-Ray Variability in Active Late-Type Dwarfs. *Carol W. Ambruster, Salvatore Sciortino, and L. Golub*. **65**, 273, 32-B4 (1987) (Abstr. in **319**, 1012, 106-A10)

Stars: Long-Period Variables

- First Unambiguous X-Ray Detection of R Aquarii. *R. Viotti, L. Piro, M. Friedjung, and A. Cassatella*. **319**, L7, 100-A10 (1987)
- Ground-based Infrared Observations of Variable IRAS Sources as Candidates for Late Asymptotic Giant Branch Stars. *Sun Kwok, Bruce J. Hrivnak, and R. T. Boreiko*. **321**, 975, 135-B11 (1987)
- H₂O Masers in Circumstellar Envelopes. *Adair P. Lane, K. J. Johnston, P. F. Bowers, J. H. Spencer, and P. J. Diamond*. **323**, 756, 163-A8 (1987)

Stars: Luminosities

- The Baade-Wesselink Method and the Distances to RR Lyrae Stars. II. The Field Star X Arietis. *Rodney V. Jones, Bruce W. Carney, David W. Latham, and Robert L. Kurucz*. **312**, 254, 3-F5 (1987)
- The Formation of a 1.5 M_{\odot} Carbon Star with $M_{\text{bol}} = -4.4$. *John C. Lattanzio*. **313**, L15, 21-B3 (1987)
- The Baade-Wesselink Method and the Distances to RR Lyrae Stars. III. The Field Star SW Draconis. *Rodney V. Jones, Bruce W. Carney, David W. Latham, and Robert L. Kurucz*. **314**, 605, 36-B10 (1987)
- The Einstein View of the Wolf-Rayet Stars. *A. M. T. Pollock*. **320**, 283, 111-B12 (1987)

Stars: Magnetic

- Winds from Rotating, Magnetic, Hot Stars. III. The Azimuthal Velocity and Magnetic Force. *K. B. MacGregor and D. B. Friend*. **312**, 659, 10-B6 (1987)
- Radiation Gas Dynamics of Polar Cap Accretion onto Magnetized Neutron Stars: Basic Theory. *Jonathan Arons, Richard I. Klein, and Susan M. Lea*. **312**, 666, 10-C1 (1987)
- The Dynamical Oscillation and Propulsion of Magnetic Fields in the Convective Zone of a Star. I. General Considerations. *E. N. Parker*. **312**, 868, 12-D6 (1987)
- Magnetic Field Measurements on the Sun and Implications for Stellar Magnetic Field Observations. *Wei-Hsin Sun, Mark S. Giampapa, and Simon P. Worden*. **312**, 930, 13-B1 (1987)
- Magnetic Field Evolution in White Dwarfs. *C. E. Wendell, H. M. Van Horn, and D. Sargent*. **313**, 284, 18-A12 (1987)
- The Evolution of Magnetic Cataclysmic Variables. *J. M. Hameury, A. R. King, J. P. Lasota, and H. Ritter*. **316**, 275, 53-A9 (1987)
- Einstein Observations of EF Eridani (2A 0311 – 227), the Textbook Example of AM Herculis-type Systems. *K. Beuermann, L. Stella, and J. Patterson*. **316**, 360, 54-A6 (1987)
- Absorption Features from the Accretion Column in E1405 – 451. *D. T. Wickramasinghe, I. R. Tuohy, and N. Visvanathan*. **318**, 326, 82-D8 (1987)
- The Rotationally Modulated Zeeman Spectrum at Nearly 10^9 Gauss of the White Dwarf PG 1031 + 234. *William B. Latter, Gary D. Schmidt, and Richard F. Green*. **320**, 308, 111-D9 (1987)
- Polarized Radiation from Extended Magnetic Polar Caps. *G. Channugam and J. Frank*. **320**, 746, 118-A1 (1987)
- Radiatively Driven Winds from Magnetic, Fast-rotating Stars: Wolf-Rayet Stars? *Steven Nerney and S. T. Suess*. **321**, 355, 126-B3 (1987)
- The Dynamical Oscillation and Propulsion of Magnetic Fields in the Convective Zone of a Star. II. Thermal Shadows. *E. N. Parker*. **321**, 984, 135-C6 (1987)
- Synchronization-induced Period Gaps and Ultra-Short Periods in Magnetic Cataclysmic Binaries. *D. Q. Lamb and Fulvio Melia*. **321**, L133, 137-C11 (1987)
- The Discovery of Nonthermal Radio Emission from Magnetic Bp–Ap Stars. *Stephen A. Drake, David C. Abbott, T. S. Bastian, J. H. Bieging, E. Churchwell, G. Dulk, and Jeffrey L. Linsky*. **322**, 902, 149-F10 (1987)
- Magnetic Activity, Tides, and Orbital Period Changes in Close Binaries. *James H. Applegate and Joseph Patterson*. **322**, L99, 152-D4 (1987)
- Magnetic Field Measurements of Helium-strong Stars. *David A. Bohlender, Douglas N. Brown, J. D. Landstreet, and Ian B. Thompson*. **323**, 325, 156-E8 (1987)
- Discovery of Radio Emission from AE Aquarii. *J. A. Bookbinder and D. Q. Lamb*. **323**, L131, 164-D7 (1987)
- The Evolution of the Magnetic Fields of Ap Stars: Magnetic Observations of Stars in the Scorpius-Centaurus Association. *Ian B. Thompson, Douglas N. Brown, and John D. Landstreet*. **64**, 219, 19-B11 (1987) (Abstr. in **315**, 732, 48-E13)

Stars: Massive

- A New Estimate of the Mixing Length and Convective Overshooting in Massive Stars. *Lawrence D. Cloutman*. **313**, 699, 24-D8 (1987)
- Neutron Capture Nucleosynthesis during Core Helium Burning in Massive Stars. *N. Prantzos, M. Arnould, and J.-P. Arcoragi*. **315**, 209, 42-C6 (1987)
- Conditions for the Formation of Massive Stars. *Mark G. Wolfire and Joseph P. Cassinelli*. **319**, 850, 104-C7 (1987)
- The Production of ^{26}Al in Supermassive Stars and the Gamma-Ray Line Flux from the Galactic Center. *Wolfgang Hillebrandt, Friedrich-Karl Thielemann, and Norbert Langer*. **321**, 761, 132-G7 (1987)
- Recent Massive Star Formation in 30 Doradus. *Nolan R. Walborn and J. Chris Blades*. **323**, L65, 158-E6 (1987)

Stars: Mass Loss

- Mass Loss from FU Orionis Objects. *Ken Crowell, L. Hartmann, and E. H. Avrett*. **312**, 227, 3-D6 (1987)
- Some Comments on Empirical Fits to Stellar Mass Loss Rates. *M. S. Vardya*. **312**, 812, 11-F13 (1987)
- A Detailed Analysis of the Radio Emission from the Symbiotic Star RX Puppis. *E. R. Seaquist and A. R. Taylor*. **312**, 813, 11-G1 (1987)
- Mass-losing Red Giants in Open Clusters. *M. Jura*. **313**, 743, 25-A1 (1987)
- High-Resolution Observations of CO from the Bipolar Nebula CRL 2688. *R. Kawabe, M. Ishiguro, T. Kasuga, K.-I. Morita, N. Ukita, H. Kobayashi, S. Okumura, E. Fomalont, and N. Kaifu*. **314**, 322, 31-F1 (1987)
- Detection of H I Emission from the Circumstellar Envelope of Alpha Orionis. *P. F. Bowers and G. R. Knapp*. **315**, 305, 43-C4 (1987)

- The Relation between Apparent Temperature and Mass-Loss Rate in Hypergiant Eruptions. *Kris Davidson*. **317**, 760, 74-C12 (1987)
- The Infrared Emission-Line Spectrum of γ Cassiopeiae. *F. Hamann and M. Simon*. **318**, 356, 82-F10 (1987)
- Thresholds for Rapid Mass Transfer in Binary System. I. Polytropic Models. *Michael S. Hjellming and Ronald F. Webbink*. **318**, 794, 89-E10 (1987)
- A Hot, Low Mass-Loss Rate Inner Envelope in IRC +10216. *R. Sahai*. **318**, 809, 89-F11 (1987)
- Jets from Young Stars: CCD Imaging, Long-Slit Spectroscopy, and Interpretation of Existing Data. *Reinhard Mundt, Edward W. Brugel, and Thomas Bührke*. **319**, 275, 96-A6 (1987)
- A Comparison between Mass-losing and Standard Solar Models. *Joyce A. Guzik, L. A. Willson, and Wendee M. Brunish*. **319**, 957, 105-D5 (1987)
- Angular Diameters and Fluxes of Magellanic Cloud Planetary Nebulae. II. High-Speed Direct Imaging. *P. R. Wood, S. J. Meatheringham, M. A. Dopita, and D. H. Morgan*. **320**, 178, 110-A11 (1987)
- M Giants in Baade's Window: Infrared Colors, Luminosities, and Implications for the Stellar Content of E and S0 Galaxies. *Jay A. Frogel and A. E. Whitford*. **320**, 199, 110-C10 (1987)
- Water Masers Associated with Low-Mass Stars: A Survey of the Rho Ophiuchi Infrared Cluster. *B. A. Wilking and M. J. Claussen*. **320**, L133, 121-E4 (1987)
- The Evolution of Asymptotic Giant Branch Stars in the Magellanic Clouds. III. The Problem of Intermediate-Mass Stars. *Jeremy Mould and Neill Reid*. **321**, 156, 124-A1 (1987)
- Forbidden Line and H α Profiles in T Tauri Star Spectra: A Probe of Anisotropic Mass Outflows and Circumstellar Disks. *Suzan Edwards, Sylvie Cabrit, Stephen E. Strom, Ingeborg Heyer, Karen M. Strom, and E. Anderson*. **321**, 473, 127-C10 (1987)
- Ground-based Infrared Observations of Variable IRAS Sources as Candidates for Late Asymptotic Giant Branch Stars. *Sun Kwok, Bruce J. Hrivnak, and R. T. Boreiko*. **321**, 975, 135-B11 (1987)
- Selective Mass Loss, Abundance Anomalies, and Helium-rich Stars. *G. Michaud, J. Dupuis, G. Fontaine, and T. Montmerle*. **322**, 302, 141-B7 (1987)
- High Spectral Resolution Infrared Observations of V1057 Cygni. *L. Hartmann and S. J. Kenyon*. **322**, 393, 142-B6 (1987)
- Properties of Evolved Mass-losing Stars in the Milky Way and Variations in the Interstellar Dust Composition. *Harley A. Thronson, Jr., William B. Latter, John H. Black, John Bally, and Perry Hacking*. **322**, 770, 148-C5 (1987)
- Evolution of a 0.7 M_{\odot} Red Giant. *Amos Harpaz, Attay Kovetz, and Giora Shaviv*. **323**, 154, 154-F13 (1987)
- Three-dimensional Hydrodynamical Simulations of Stellar Collisions. I. Equal-Mass Main-Sequence Stars. *W. Benz and J. G. Hills*. **323**, 614, 161-D9 (1987)
- Spectral Energy Distributions of T Tauri Stars: Disk Flaring and Limits on Accretion. *S. J. Kenyon and L. Hartmann*. **323**, 714, 162-E3 (1987)
- Mass Loss from Evolved Stars. VII. OH Maser Shell Radii and Mass-Loss Rates for OH/IR Stars. *Nathan Netzer and G. R. Knapp*. **323**, 734, 162-F12 (1987)
- An Empirical Model for the Wolf-Rayet Star HD 50896. *D. J. Hillier*. **323**, 965, 15-G12 (1987) (Abstr. in **314**, 833, 38-F9)
- A Flux-limited Sample of Galactic Carbon Stars. *M. J. Claussen, S. G. Kleinmann, R. R. Joyce, and M. Jura*. **323**, 385, 33-F1 (1987) (Abstr. in **321**, 1050, 136-A1)
- Recurrent Episodic Mass Loss in a B2e Star: 66 Ophiuchi, 1982-1985. *C. A. Grady, George Sonneborn, Chi-Chao Wu, and H. F. Henrichs*. **323**, 673, 39-A2 (1987) (Abstr. in **322**, 1077, 151-G3)
- Stars: Metallic-Line**
- Lithium in the Coma Cluster. *Ann Merchant Boesgaard*. **321**, 967, 135-B3 (1987)
- Atmospheric Abundances of Classical Metallic-Line A Stars: The Visual Spectral Region. *M. C. Lane and John B. Lester*. **321**, 137, 29-D1 (1987) (Abstr. in **319**, 1013, 106-A11)
- Stars: Neutron**
- Radiation Gas Dynamics of Polar Cap Accretion onto Magnetized Neutron Stars: Basic Theory. *Jonathan Arons, Richard I. Klein, and Susan M. Lea*. **312**, 666, 10-C1 (1987)
- Quasi-static Winds from Neutron Stars. *Paul C. Joss and Fulvio Melia*. **312**, 700, 10-E7 (1987)
- Cooling of Neutron Stars: Effects of the Finite Time Scale of Thermal Conduction. *Ken'ichi Nomoto and Sachiko Tsuruta*. **312**, 711, 10-F4 (1987)
- A Search for Millisecond Periodic and Quasi-periodic Pulsations in Low-Mass X-Ray Binaries. *S. Mereghetti and J. E. Grindlay*. **312**, 727, 10-G6 (1987)
- Characteristics of Old Neutron Stars in Dense Interstellar Clouds. *H. Böhringer, G. E. Morfill, and H. U. Zimmermann*. **313**, 218, 17-D1 (1987)
- The X-Ray Emission from Gamma-Ray Burst Sources: Constraints on Theoretical Models. *James N. Imamura and Richard I. Epstein*. **313**, 711, 24-E6 (1987)
- Model Atmospheres for Cooling Neutron Stars. *Roger W. Romani*. **313**, 718, 24-E13 (1987)
- Discovery of an X-Ray Burst from 4U 2129 + 47. *Michael R. Garcia and Jonathan E. Grindlay*. **313**, L59, 27-C1 (1987)
- G0.9 + 0.1 and the Emerging Class of Composite Supernova Remnants. *D. J. Helfand and R. H. Becker*. **314**, 203, 30-C10 (1987)
- Deceleration of Infalling Plasma in the Atmospheres of Accreting Neutron Stars. I. Isothermal Atmospheres. *G. S. Miller, E. E. Salpeter, and I. Wasserman*. **314**, 215, 30-D13 (1987)
- The Effect of Viscosity on Neutron Star Oscillations. *Curt Cutler and Lee Lindblom*. **314**, 234, 30-F4 (1987)
- EXOSAT Observations of Double-peaked Bursts with Radius Expansion from 4U/MXB 1820 - 30. *F. Haberl, L. Stella, N. E. White, W. C. Priedhorsky, and M. Gottwald*. **314**, 266, 31-A9 (1987)
- On the Maximum Mass of a Uniformly Rotating Neutron Star. *John L. Friedman and James R. Ipser*. **314**, 594, 36-A13 (1987)
- Spectra and Pulse Profile of the Binary X-Ray Pulsar 4U 1538 - 52. *K. Makishima, K. Koyama, S. Hayakawa, and F. Nagase*. **314**, 619, 36-C10 (1987)
- A Possible 1.13 Millisecond Periodicity in GX 339 - 4. *James N. Imamura, Thomas Y. Steiman-Cameron, and John Middleton*. **314**, L11, 33-B13 (1987)
- Thermal Evolution of Accreting Neutron Stars. II. Long X-Ray Bursts as a Probe Into the Interior. *Masayuki Y. Fujimoto, Tomoyuki Hanawa, Ikko Iben, Jr., and Martin B. Richardson*. **315**, 198, 42-B9 (1987)
- Multipeaked X-Ray Bursts from 4U/MXB 1636 - 53: Evidence for Burst-induced Accretion Disk Coronae. *Fulvio Melia*. **315**, L43, 45-D12 (1987)
- Neutrino Emission Processes in Hyperon-populated Neutron Stars. *Oren V. Maxwell*. **316**, 691, 59-E14 (1987)
- On the Evolution of Tidal Capture X-Ray Binaries: 4U 2127 + 12 (M15) to 4U 1820 - 30 (NGC 6624). *Charles D. Bailyn and Jonathan E. Grindlay*. **316**, L25, 56-C3 (1987)
- The Role of the Viscous Secular Instability in Rotating Neutron Stars. *Lee Lindblom*. **317**, 325, 67-D9 (1987)
- Viscosity of Dense Matter. *Naoki Itoh, Yasuhiro Kohyama, and Hideo Tekeuchi*. **317**, 733, 74-A13 (1987)
- Effect of an Electron Scattering Cloud on X-Ray Oscillations Produced by Beaming. *J. Brainerd and F. K. Lamb*. **317**, L33, 71-C6 (1987)
- Nonradial g-Mode Oscillations in X-Ray Bursting Neutron Stars. *P. N. McDermott and Ronald E. Taam*. **318**, 278, 82-A1 (1987)
- A Deep Optical Study of the Field of 1E 0630 + 178. *G. F. Bignami, P. A. Caraveo, J. A. Paul, L. Salotti, and L. Vigroux*. **319**, 358, 97-A1 (1987)
- EXOSAT Observations of 4U/MXB 1636 - 53: On the Relation between the Amount of Accreted Fuel and the Strength of an X-Ray Burst. *W. H. G. Lewin, W. Penninx, J. van Paradijs, E. Damen, M. Sztajno, J. Trümper, and M. van der Klis*. **319**, 893, 104-F9 (1987)
- On the Theory of Type I X-Ray Bursts. The Energetics of Bursts and the Nuclear Fuel Reservoir in the Envelope. *Masayuki Y. Fujimoto, Mirek Sztajno, Walter H. G. Lewin, and Jan van Paradijs*. **319**, 902, 104-G5 (1987)
- A Rapid Change of the Hercules X-1 Pulse Profile and High-State Duration. *Yang Soong, Duane E. Gruber, and Richard E. Rothschild*. **319**, L77, 107-E3 (1987)
- Pulsar-like Emission from the Supernova Remnant CTB 80. *Richard G. Strom*. **319**, L103, 107-F13 (1987)
- Collapsing White Dwarfs. *E. Baron, J. Cooperstein, S. Kahana, and K. Nomoto*. **320**, 304, 111-D5 (1987)
- Rapid Optical Flaring in MXB 1735 - 444 and an Optical Burst from GX 17 + 2. *James N. Imamura, Thomas Y. Steiman-Cameron, and John Middleton*. **320**, L41, 114-D3 (1987)
- Outer Magnetospheric Fluctuations and Pulsar Timing Noise. *K. S. Cheng*. **321**, 799, 133-C9 (1987)
- Could Glitches Inducing Magnetospheric Fluctuations Produce Low-Frequency Pulsar Timing Noise? *K. S. Cheng*. **321**, 805, 133-C13 (1987)
- The Self-similar Cosmological Paradigm: A New Test and Two New Predictions. *Robert L. Oldershaw*. **322**, 34, 138-C12 (1987)
- Axion Bremsstrahlung in Dense Stars. *Masayuki Nakagawa, Yasuhiro Kohyama, and Naoki Itoh*. **322**, 291, 141-A9 (1987)
- Neutrino-Pair Bremsstrahlung in Dense Stars. IV. Phonon Contributions in the Crystalline Lattice Phase: Erratum. *Naoki Itoh, Yasuhiro Kohyama, Noriyoshi Matsumoto, and Midori Seki*. **322**, 584, 144-C9 (1987) (Orig. paper in **285**, 304, 113-C2)

Stars: Neutron—Continued

- The Effect of Decay of the Amplitude of Oscillation on Random Process Models for QPO X-Ray Stars. *N. Shibasaki, R. F. Elsner, and M. C. Weisskopf.* **322**, 831, 149-A1 (1987)
- Degenerate Dwarf Binaries as Promising, Detectable Sources of Gravitational Radiation. *Charles R. Evans, Icko Iben, Jr., and Larry Smarr.* **323**, 129, 154-E1 (1987)
- Model Atmospheres of Near-Eddington Limit X-Ray Bursters. *Arif Babul and Bohdan Paczyński.* **323**, 582, 161-B5 (1987)
- New Insights from a Global View of X-Ray Bursts. *Ikko Fushiki and D. Q. Lamb.* **323**, L55, 158-D10 (1987)
- Ohmic Decay of Crustal Neutron Star Magnetic Fields. *Yeming Sang and G. Channugam.* **323**, L61, 158-E2 (1987)
- On the Radius of Neutron Stars. *P. Mészáros and H. Riffert.* **323**, L127, 164-D3 (1987)

Stars: Novae

- The Nature of the Recurrent Novae. *Ronald F. Webbink, Mario Livio, James W. Truran, and Marina Orio.* **314**, 653, 36-F9 (1987)
- Gamma-Ray Constraints on ^{22}Na Yields in Nova Explosions. *J. C. Higdon and William A. Fowler.* **317**, 710, 73-G2 (1987)
- Spin-up and Mixing in Accreting White Dwarfs. *Mario Livio and James W. Truran.* **318**, 316, 82-C12 (1987)
- Observations of Novae in the Virgo Cluster. *Christopher J. Pritchett and Sidney van den Bergh.* **318**, 507, 86-D7 (1987)
- The Spatial Distribution and Population of Novae in M31. *Robin Ciardullo, Holland C. Ford, James D. Neill, George H. Jacoby, and Allen W. Shafter.* **318**, 520, 86-E6 (1987)
- Binary System Parameters and the Hibernation Models of Cataclysmic Variables. *Mario Livio and Michael M. Shara.* **319**, 819, 104-A4 (1987)
- Polarized Radiation from Extended Magnetic Polar Caps. *G. Channugam and J. Frank.* **320**, 746, 118-A1 (1987)
- Stellar Accretion of Matter Possessing Angular Momentum. *G. Siegfried Kutter and Warren M. Sparks.* **321**, 386, 126-D7 (1987)
- Nuclear Runaways in a C/O White Dwarf Accreting H-rich Material Possessing Angular Momentum. *Warren M. Sparks and G. Siegfried Kutter.* **321**, 394, 126-E1 (1987)
- The Effect of Heating from the Boundary Layer on Accretion Models for Novae and Other Compact Objects. *Giora Shaviv and Sumner Starrfield.* **321**, L51, 129-F3 (1987)
- Positron Annihilation Gamma Rays from Novae. *Mark D. Leising and Donald D. Clayton.* **323**, L59, 154-G4 (1987)
- Discovery of Radio Emission from AE Aquarii. *J. A. Bookbinder and D. Q. Lamb.* **323**, L131, 164-D7 (1987)

Stars: Of-Type

- Optical Spectroscopy of IRAS Sources with Infrared Emission Bands: IRAS 21282 + 5050 and the Diffuse Interstellar Bands. *Martin Cohen and B. F. Jones.* **321**, L151, 137-E1 (1987)

Stars: Peculiar A

- The Rich p -Mode Spectrum of the Rapidly Oscillating Peculiar A Star HD 60435. *Jaymie M. Matthews, Donald W. Kurtz, and William H. Wenhau.* **313**, 782, 25-C12 (1987)
- The Abundance of Gallium in B-Type Chemically Peculiar Stars: Addendum. *Masahide Takada-Hidai, Kozo Sadakane, and Jun Jugaku.* **320**, 437, 112-G4 (1987) (Orig. paper in **304**, 425, 58-D14)
- Doppler Images of Rotating Stars Using Maximum Entropy Image Reconstruction. *Steven S. Vogt, G. Donald Penrod, and Artie P. Hatzes.* **321**, 496, 127-E5 (1987)
- The Discovery of Nonthermal Radio Emission from Magnetic Bp-Ap Stars. *Stephen A. Drake, David C. Abbott, T. S. Bastian, J. H. Bieging, E. Churchwell, G. Dulk, and Jeffrey L. Linsky.* **322**, 902, 149-F10 (1987)
- Magnetic Field Measurements of Helium-strong Stars. *David A. Bohlender, Douglas N. Brown, J. D. Landstreet, and Ian B. Thompson.* **323**, 325, 156-E8 (1987)
- The Evolution of the Magnetic Fields of Ap Stars: Magnetic Observations of Stars in the Scorpius-Centaurus Association. *Ian B. Thompson, Douglas N. Brown, and John D. Landstreet.* **64**, 219, 19-B11 (1987) (Abstr. in **315**, 732, 48-E13)

Stars: Population II

- Nitrogen and Sulfur Overabundances in the Population II Supergiant HD 46703. *Howard E. Bond and R. Earle Luck.* **312**, 203, 3-B10 (1987)
- Spectroscopy and JHK Photometry of Type II Cepheids in the Magellanic Clouds. *Douglas L. Welch.* **317**, 672, 73-D6 (1987)
- Kinematics and Age of the Low-Mass X-Ray Binaries. *A. P. Cowley, J. B. Hutchings, David Crampton, and F. D. A. Hartwick.* **320**, 296, 111-C11 (1987)
- Evolution of Very Low Mass Stars and Brown Dwarfs. II. The Population II. *Francesca D'Antona.* **320**, 653, 117-A1 (1987)

- Evolutionary Sequences for Horizontal-Branch Stars. *Allen V. Sweigart.* **65**, 95, 29-A1 (1987) (Abstr. in **319**, 1012, 106-A10)

Stars: Pre-Main-Sequence

- Mass Loss from FU Orionis Objects. *Ken Crowell, L. Hartmann, and E. H. Avrett.* **312**, 227, 3-D6 (1987)
- Further Evidence for Disk Accretion in FU Orionis Objects. *L. Hartmann and S. J. Kenyon.* **312**, 243, 3-E8 (1987)
- Emission from CO Band Heads in Young Stellar Objects. *T. R. Geballe and S. E. Persson.* **312**, 297, 4-B8 (1987)
- Line Excess in Low-Luminosity Young Stellar Objects. *Rodger I. Thompson.* **312**, 784, 11-D13 (1987)
- Spectral Evolution of Young Stellar Objects. *Fred C. Adams, Charles J. Lada, and Frank H. Shu.* **312**, 788, 11-E3 (1987)
- A Hard X-Ray Source in the Nearest Molecular Cloud. *J. P. Halpern and J. Patterson.* **312**, L31, 7-C2 (1987)
- A Pre-Main-Sequence Star in the Detached Binary EK Cephei. *Daniel M. Popper.* **313**, L81, 27-D7 (1987)
- An Active Star Formation Site in RCW 108. *Steven Straw, A. R. Hyland, Terry J. Jones, Paul M. Harvey, Bruce A. Wilking, and Marshall Joy.* **314**, 283, 31-B12 (1987)
- X-Ray Sources in Regions of Star Formation. II. The Pre-Main-Sequence G Star HDE 283572. *F. M. Walter, A. Brown, J. L. Linsky, A. E. Rydgren, F. Vrba, M. Roth, L. Carrasco, P. F. Chugainov, N. I. Shakowskaya, and C. L. Imhoff.* **314**, 297, 31-D2 (1987)
- Observation of the HH 1 and 2 Region with IRAS. *Steven H. Pravdo and Thomas J. Chester.* **314**, 308, 31-D13 (1987)
- Compact Continuum Radio Sources in the Orion Nebula. *Guido Garay, James M. Moran, and Mark J. Reid.* **314**, 535, 35-D2 (1987)
- Low-Mass, Pre-Main-Sequence Stars: The Infrared Emission from Circumstellar Dust. *M. G. Wolfire and E. Churchwell.* **315**, 315, 43-C14 (1987)
- Low-Luminosity Embedded Sources and Their Environs. *J. A. Davidson.* **315**, 602, 47-C4 (1987)
- The Dispersal of Dense Protostellar Material: NH_3 Hot Cores and Outflows in Sagittarius B2. *S. N. Vogel, R. Genzel, and Patrick Palmer.* **316**, 243, 52-F3 (1987)
- IRAS Observations of the Exciting Stars of Herbig-Haro Objects. *Martin Cohen and Richard D. Schwartz.* **316**, 311, 53-D3 (1987)
- Radiative Bow Shock Models of Herbig-Haro Objects. *Patrick Hartigan, John Raymond, and Lee Hartmann.* **316**, 323, 53-D14 (1987)
- Ultraviolet Spectra of HH 1 and HH 2: Spatial Variations and the Continuum Problem. *K. H. Böhm, Th. Bührke, A. C. Raga, E. W. Bruge, A. N. Witt, and R. Mundt.* **316**, 349, 53-G7 (1987)
- Bipolar Flows, Molecular Gas Disks, and the Collapse and Accretion of Rotating Interstellar Clouds. *Alan P. Boss.* **316**, 721, 60-A6 (1987)
- Polarization, Jets, and the Distribution of Circumstellar Dust around T Tauri Stars and Other Young Infrared Sources. *Pierre Bastien.* **317**, 231, 66-D12 (1987)
- CS Observations of L1551: No Rotating Disk. *G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, and G. L. Grasdale.* **317**, L95, 78-D13 (1987)
- OH Outflows in Star-forming Regions. *I. F. Mirabel, A. Ruiz, L. F. Rodriguez, and J. Cantó.* **318**, 729, 89-A1 (1987)
- The Atmospheres of T Tauri Stars. I. High-Resolution Calibrated Observations of Moderately Active Stars. *Ulrich Finkenzeller and Gabor Basri.* **318**, 823, 90-A2 (1987)
- Jets from Young Stars: CCD Imaging, Long-Slit Spectroscopy, and Interpretation of Existing Data. *Reinhard Mundt, Edward W. Bruge, and Thomas Bührke.* **319**, 275, 96-A6 (1987)
- Near-Infrared and Optical Observations of IRAS Sources in and near Dense Cores. *P. C. Myers, Gary A. Fuller, R. D. Mathieu, C. A. Beichman, P. J. Benson, R. E. Schild, and J. P. Emerson.* **319**, 340, 96-F5 (1987)
- Anomalous Distribution of Axial Inclinations of T Tauri Stars. *Wm. Bruce Weaver.* **319**, L89, 107-E3 (1987)
- Structure of a Possible Circumbinary Disk around T Tauri. *D. A. Weintraub, C. R. Masson, and B. Zuckerman.* **320**, 336, 111-F9 (1987)
- Milliarcsecond Resolution Infrared Observations of Young Stars in Taurus and Ophiuchus. *M. Simon, R. R. Howell, A. J. Longmore, B. A. Wilking, D. M. Peterson, and W.-P. Chen.* **320**, 344, 111-G3 (1987)
- A Possible Protostar near HH 7-11. *E. N. Grossman, C. R. Masson, A. I. Sargent, N. Z. Scoville, S. Scott, and D. P. Woody.* **320**, 356, 112-A1 (1987)
- Observations of Infrared Emission Lines and Radio Continuum Emission from Pre-Main-Sequence Objects. *Neal J. Evans II, Russell M. Leveault, S. Beckwith, and Mike Skrutskie.* **320**, 364, 112-A9 (1987)
- Spectroscopy of the Rapidly Rotating K Star HD 36705. *O. Vilhu, B. Gustafsson, and B. Edvardsson.* **320**, 850, 119-B5 (1987)
- Water Masers Associated with Low-Mass Stars: A Survey of the Rho Ophiuchi Infrared Cluster. *B. A. Wilking and M. J. Claussen.* **320**, L133, 121-E4 (1987)

- A New Cometary Nebula in Cygnus. *Th. Neckel and H. J. Staudé*. **320**, L145, 121-F1 (1987)
- A Survey of IRAS Point Sources in Taurus for High-Velocity Molecular Gas. *Mark H. Heyer, Ronald L. Snell, Paul F. Goldsmith, and Philip C. Myers*. **321**, 370, 126-C3 (1987)
- Forbidden Line and H α Profiles in T Tauri Star Spectra: A Probe of Anisotropic Mass Outflows and Circumstellar Disks. *Suzan Edwards, Sylvie Cabrit, Stephen E. Strom, Ingeborg Heyer, Karen M. Strom, and E. Anderson*. **321**, 473, 127-C10 (1987)
- Observations of Jets from Low-Luminosity Stars. II. SVS 12, HH 30, Near HL Tauri, and HH 34. *Martin Cohen and B. F. Jones*. **321**, 846, 133-F13 (1987)
- The 2 Micron Spectrum of L1551 IRS 5. *John S. Carr, P. M. Harvey, and D. F. Lester*. **321**, L71, 129-G7 (1987)
- High Spectral Resolution Infrared Observations of V1057 Cygni. *L. Hartmann and S. J. Kenyon*. **322**, 393, 142-B6 (1987)
- Near-Infrared H $_2$ Emission from Herbig-Haro Objects. I. A Survey of Low-Excitation Objects. *Richard D. Schwartz, Martin Cohen, and Peredur M. Williams*. **322**, 403, 142-C2 (1987)
- Temporal Changes of the IRS 5 Jet in L1551. *Th. Neckel and H. J. Staudé*. **322**, L27, 145-B13 (1987)
- Radio Emission from Pre-Main-Sequence Stars in Corona Australis. *Alexander Brown*. **322**, L31, 145-C3 (1987)
- Time-dependent Bow Shocks and the Condensation Structure of Herbig-Haro Objects. *A. C. Raga and K. H. Böhm*. **323**, 193, 155-B10 (1987)
- Kinematics of the Circumstellar Gas of HL Tauri and R Monocerotis. *Annela I. Sargent and Steven Beckwith*. **323**, 294, 156-C5 (1987)
- Spectral Energy Distributions of T Tauri Stars: Disk Flaring and Limits on Accretion. *S. J. Kenyon and L. Hartmann*. **323**, 714, 162-E3 (1987)
- Stars: Pulsation**
- The Baade-Wesselink Method and the Distances to RR Lyrae Stars. II. The Field Star X Arietis. *Rodney V. Jones, Bruce W. Carney, David W. Latham, and Robert L. Kurucz*. **312**, 254, 3-F5 (1987)
- A Search for Millisecond Periodic and Quasi-periodic Pulsations in Low-Mass X-Ray Binaries. *S. Mereghetti and J. E. Grindlay*. **312**, 727, 10-G6 (1987)
- On the Interpretation of the Sandage Period-Shift Effect among Globular Cluster RR Lyrae Variables. *Allen V. Sweigart, Alvio Renzini, and Amedeo Tornambè*. **312**, 762, 11-C4 (1987)
- The Rich *p*-Mode Spectrum of the Rapidly Oscillating Peculiar A Star HD 60435. *Jaymie M. Matthews, Donald W. Kurtz, and William H. Wehlau*. **313**, 782, 25-C12 (1987)
- Correlation between Spectral State and Quasi-periodic Oscillation Parameters in GX 5-1. *M. van der Klis, F. Jansen, J. van Paradijs, W. H. G. Lewin, M. Sztajno, and J. Trümper*. **313**, L19, 21-B7 (1987)
- On the Lack of Evidence for Nonradial Pulsation in Wolf-Rayet Stars. *Jaymie M. Matthews and Martin Beech*. **313**, L25, 21-B12 (1987)
- Overtone Pulsation in Stars. *R. F. Stellingwerf, A. Gautschi, and R. J. Dickens*. **313**, L75, 27-D2 (1987)
- The Effect of Viscosity on Neutron Star Oscillations. *Curt Cutler and Lee Lindblom*. **314**, 234, 30-F4 (1987)
- Velocity Structure of Stellar Atmospheres: R Scuti. *David Mozurkewich, R. D. Gehrz, K. H. Hinkle, and D. L. Lambert*. **314**, 242, 30-F12 (1987)
- Fourier Coefficients of Variable Stars. II. Light-Curve Analysis. *R. F. Stellingwerf and M. Donohoe*. **314**, 252, 30-G8 (1987)
- Pioneer 10 Observations of the Beta Cephei Stars Gamma Pegasi and Delta Ceti. *Geraldine J. Peters, H. S. Ogawa, K. S. Judge, and D. L. Judge*. **314**, 261, 31-A3 (1987)
- A New Driving Mechanism for Stellar Pulsations. *W. De n Pesnell*. **314**, 598, 36-B3 (1987)
- The Baade-Wesselink Method and the Distances to RR Lyrae Stars. III. The Field Star SW Draconis. *Rodney V. Jones, Bruce W. Carney, David W. Latham, and Robert L. Kurucz*. **314**, 605, 36-B10 (1987)
- The Discovery of 15-30 Hertz Quasi-periodic Oscillations in the X-Ray flux of 4U 1820 - 30. *L. Stella, N. E. White, and W. Priedhorsky*. **315**, L49, 45-E3 (1987)
- Two Extreme Examples of Compact Pulsators: PG 1115 + 158 and PG 1351 + 489. *D. E. Winget, R. E. Nather, and J. Allen Hill*. **316**, 305, 53-C11 (1987)
- Intensity and Source State Dependence of the Quasi-periodic Oscillations in Scorpius X-1. *M. van der Klis, L. Stella, N. White, F. Jansen, and A. N. Parmar*. **316**, 411, 54-F3 (1987)
- Pulsations of White Dwarf Stars with Thick Hydrogen or Helium Surface Layers. *Arthur N. Cox, Sumner G. Starrfield, Russell B. Kidman, and W. Dean Pesnell*. **317**, 303, 67-B14 (1987)
- Evidence for Periodic Radial Velocity Variations in Arcturus. *P. H. Smith, R. S. McMillan, and W. J. Merline*. **317**, L79, 78-C12 (1987)
- Periodic Photospheric and Chromospheric Modulation in Alpha Orionis (Betelgeuse). *A. K. Dupree, S. L. Baliunas, E. F. Guinan, L. Hartmann, G. E. Nassisopoulos, and G. Sonneborn*. **317**, L86, 78-D4 (1987)
- Modal Selection in Stellar Pulsators. II. Application to RR Lyrae Models. *J. Robert Buchler and Géza Kovács*. **318**, 232, 81-D7 (1987)
- The Formation and Evolution of Tidal Binary Systems. *Stephen L. W. McMillan, P. N. McDermott, and Ronald E. Taam*. **318**, 261, 81-F11 (1987)
- Nonradial *g*-Mode Oscillations in X-Ray Bursting Neutron Stars. *P. N. McDermott and Ronald E. Taam*. **318**, 278, 82-A1 (1987)
- Application of Time-dependent Fourier Analysis to Nonlinear Pulsational Stellar Models. *G. Kovács, J. R. Buchler, and C. G. Davis*. **319**, 247, 95-F6 (1987)
- Second-Overtone Models of RR Lyrae Stars. *Richard B. Stothers*. **319**, 260, 95-G5 (1987)
- Spectroscopy of the Optical Photosphere of the Hot Pulsating Star BW Vulpeculae. *Ingemar Furenlid, Arthur Young, Thomas Meylan, Chester Haag, and Greg Crinklaw*. **319**, 264, 95-G9 (1987)
- The Complex Cross-Spectra of Cygnus X-2 and GX 5-1. *M. van der Klis, G. Hasinger, L. Stella, A. Langmeier, J. van Paradijs, and W. H. G. Lewin*. **319**, L13, 100-B2 (1987)
- Reconnection-driven Oscillations in Dwarf Novae Disks. *T. Tajima and D. Gilden*. **320**, 741, 117-G10 (1987)
- The Nonradial Oscillations of ϵ Persei. II. Nonlinear Characteristics. *Myron A. Smith, Alexander W. Fullerton, and John R. Percy*. **320**, 768, 118-B10 (1987)
- Period Doubling Bifurcations and Chaos in W Virginis Models. *J. Robert Buchler and Géza Kovács*. **320**, L57, 114-E3 (1987)
- Discovery of High-Degree Nonradial Oscillations in Rapidly Rotating δ Scuti Stars? *G. A. H. Walker, S. Yang, and G. G. Fahlgren*. **320**, L139, 121-E9 (1987)
- The Discovery of 7 and 24-28 Hertz Quasi-periodic Oscillations in the X-Ray Flux of GX 17 + 2 (4U 1812 - 14). *L. Stella, A. N. Parmar, and N. E. White*. **321**, 418, 126-F11 (1987)
- PG 0122 + 200: A New Member of the GW Virginis (PG 1159 - 035) Class of Extremely Hot Pulsating White Dwarfs. *Howard E. Bond and Albert D. Grauer*. **321**, L123, 137-C1 (1987)
- Fourier Coefficients of the RR Lyrae Variables in NGC 6171. *R. F. Stellingwerf and R. J. Dickens*. **322**, 133, 139-D2 (1987)
- The Effect of Decay of the Amplitude of Oscillations on Random Process Models for QPO X-Ray Stars. *N. Shibasaki, R. F. Elsner, and M. C. Weisskopf*. **322**, 831, 149-A1 (1987)
- A Search for Pulsating Stars Similar to PG 1159 - 035 and K1-16. *Albert D. Grauer, Howard E. Bond, James Liebert, Thomas A. Fleming, and Richard F. Green*. **323**, 271, 156-A10 (1987)
- Observational Studies of Cepheids. VI. Period-Radius Relations. *Thomas J. Moffett and Thomas G. Barnes III*. **323**, 280, 156-B5 (1987)
- On the Stability of the 13.2 Minute Oscillation of V1223 Sagittarii. *F. Jablonski and J. E. Steiner*. **323**, 672, 162-B2 (1987)
- Asymptotic Approximations for Higher Order Nonradial Oscillations of a Spherically Symmetric Star. *P. Smeyers and M. Tassoul*. **65**, 429, 34-B11 (1987) (Abstr. in **321**, 1051, 136-A2)
- Stars: Radio Radiation**
- Multiple Wavelength Microwave Observations of the RS Canum Venaticorum Stars UX Arietis, HR 1099, HR 5110, and II Pegasi. *Robert F. Willson and Kenneth R. Lang*. **312**, 278, 4-A2 (1987)
- A Detailed Analysis of the Radio Emission from the Symbiotic Star RX Puppis. *E. R. Seaquist and A. R. Taylor*. **312**, 813, 11-G1 (1987)
- Microwave Observations of Flare Stars UV Ceti, AT Microscopii, and AU Microscopii. *M. R. Kundu, P. D. Jackson, S. M. White, and M. Melozzi*. **312**, 822, 12-A1 (1987)
- Variable Radio Emission from the 4 Draconis System. *Alexander Brown*. **312**, L51, 14-C7 (1987)
- Radio Emission from FK Comae. *V. A. Hughes and B. J. McLean*. **313**, 263, 17-G5 (1987)
- Detection of H I Emission from the Circumstellar Envelope of Alpha Orionis. *P. F. Bowers and G. R. Knapp*. **315**, 305, 43-C4 (1987)
- Dynamic Spectrum of a Radio Flare on UV Ceti. *Peter D. Jackson, Mukul R. Kundu, and Stephen M. White*. **316**, L85, 62-C14 (1987)
- A Radio Survey of Symbiotic Stars: Erratum. *E. R. Seaquist, A. R. Taylor, and S. Sutton*. **317**, 555, 70-A5 (1987) (Orig. paper in **284**, 202, 100-C7)
- The Inner Beams of SS 433. *Jonathan D. Romney, Richard T. Schilizzi, István Fejes, and Ralph E. Spencer*. **321**, 822, 133-E3 (1987)
- Search for X-Ray Emission from the Radio Lobes of Scorpius X-1. *Barry Geldzahler and Paul Hertz*. **322**, 342, 141-E5 (1987)
- Radio Observations of Carbon Monoxide toward Zeta Ophiuchi: Velocity Structure, Isotopic Abundances, and Physical Properties. *William D. Langer, Alfred E. Glassgold, and Robert W. Wilson*. **322**, 450, 142-G9 (1987)
- The Discovery of Nonthermal Radio Emission from Magnetic Bp-Ap Stars. *Stephen A. Drake, David C. Abbott, T. S. Bastian, J. H.*

Stars: Radio Radiation—Continued

- Bieging, E. Churchwell, G. Dulk, and Jeffrey L. Linsky. **322**, 902, 149-F10 (1987)
 Radio Emission from Pre-Main-Sequence Stars in Corona Australis. Alexander Brown. **322**, L31, 145-C3 (1987)
 Discovery of Radio Emission from AE Aquarii. J. A. Bookbinder and D. Q. Lamb. **323**, L131, 164-D7 (1987)

Stars: Rotation

- Numerical Implementation of a Perturbation Theory Up to Third Order for Rotating Polytropic Stars: Structure Parameters under Differential Rotation. V. S. Geroyannis and F. N. Valvi. **312**, 219, 3-C12 (1987)
 Winds from Rotating, Magnetic, Hot Stars. III. The Azimuthal Velocity and Magnetic Force. K. B. MacGregor and D. B. Friend. **312**, 659, 10-B6 (1987)
 The Ellipticities of Globular Clusters and the Cyanogen Problem. John Norris. **313**, L65, 27-C7 (1987)
 The Effect of Viscosity on Neutron Star Oscillations. Curt Cutler and Lee Lindblom. **314**, 234, 30-F4 (1987)
 On the Maximum Mass of a Uniformly Rotating Neutron Star. John L. Friedman and James R. Ipser. **314**, 594, 36-A13 (1987)
 Linear and Nonlinear Dynamic Instability of Rotating Polytropes. Harold A. Williams and Joel E. Tohline. **315**, 594, 47-B10 (1987)
 The Dependence of Ultraviolet Chromospheric Emission upon Rotation among Late-Type Stars. Theodore Simon and Francis C. Fekel, Jr. **316**, 434, 54-G2 (1987)
 The Role of the Viscous Secular Instability in Rotating Neutron Stars. Lee Lindblom. **317**, 325, 67-D9 (1987)
 The Distribution of Rotational Velocities for Low-Mass Stars in the Pleiades. John R. Stauffer and Lee W. Hartmann. **318**, 337, 82-E5 (1987)
 Lower Bounds on the Masses of Rapidly Rotating White Dwarfs. G. Channugam, Meenakshi Rao, and Joel E. Tohline. **319**, 188, 95-A13 (1987)
 The Pleiades Rapid Rotators: Evidence for an Evolutionary Sequence. R. Paul Butler, Ross D. Cohen, Douglas K. Duncan, and Geoffrey W. Marcy. **319**, L19, 100-B9 (1987)
 The Poynting-Robertson Effect of a Rotating Star. Edwin T. Rusk. **320**, 315, 111-E2 (1987)
 Spectroscopy of the Rapidly Rotating K Star HD 36705. O. Vilhu, B. Gustafsson, and B. Edvardsson. **320**, 850, 119-B5 (1987)
 Rotational Velocities of Low-Mass Stars in the Hyades. John R. Stauffer, Lee W. Hartmann, and David W. Latham. **320**, L51, 114-D12 (1987)
 Radiatively Driven Winds from Magnetic, Fast-rotating Stars: Wolf-Rayet Stars? Steven Nerney and S. T. Suess. **321**, 355, 126-B3 (1987)
 The Activity, Variability, and Rotation of Lower Main-Sequence Hyades Stars. Richard R. Radick, D. T. Thompson, G. W. Lockwood, D. K. Duncan, and W. E. Baggett. **321**, 459, 127-B10 (1987)
 Doppler Images of Rotating Stars Using Maximum Entropy Image Reconstruction. Steven S. Vogt, G. Donald Penrod, and Artie P. Hatzes. **321**, 496, 127-E5 (1987)
 Chromospheric-Coronal Activity at Saturated Levels. Osmi Vilhu and Frederick M. Walter. **321**, 958, 135-A8 (1987)
 An Analysis of the Photospheric Line Profiles in F, G, and K Supergiants. David F. Gray and C. G. Toner. **322**, 360, 141-G1 (1987)
 On Synchronization in Early-Type Binaries. Jean-Louis Tassoul. **322**, 856, 149-B12 (1987)
 Fragmentation of Rapidly Rotating Gas Clouds. I. A Universal Criterion for Fragmentation. Izumi Hachisu, Joel E. Tohline, and Yoshiharu Eriguchi. **323**, 592, 161-C1 (1987)
 Stellar Multiplicity in the Scorpius-Centaurus Association. Hugo Levato, Stella Malaroda, Nidia Morrell, and Gladys Solivella. **324**, 487, 23-B8 (1987) (Abstr. in **315**, 731, 48-E12)
 Asymptotic Approximations for Higher Order Nonradial Oscillations of a Spherically Symmetric Star. P. Smeyers and M. Tassoul. **325**, 429, 34-B11 (1987) (Abstr. in **321**, 1051, 136-A2)
 The Early A Type Stars: Refined MK Classification, Confrontation with Strömgren Photometry, and the Effects of Rotation. R. O. Gray and R. F. Garrison. **325**, 581, 37-C1 (1987) (Abstr. in **322**, 1076, 151-G2)
Stars: RR Lyrae
 The Baade-Wesselink Method and the Distances to RR Lyrae Stars. II. The Field Star χ Arietis. Rodney V. Jones, Bruce W. Carney, David W. Latham, and Robert L. Kurucz. **312**, 254, 3-F5 (1987)
 On the Interpretation of the Sandage Period-Shift Effect among Globular Cluster RR Lyrae Variables. Allen V. Sweigart, Altio Renzini, and Amedeo Tornambè. **312**, 762, 11-C4 (1987)
 Overtone Pulsation in Stars. R. F. Stellingwerf, A. Gautschy, and R. J. Dickens. **313**, L75, 27-D2 (1987)
 Fourier Coefficients of Variable Stars. II. Light-Curve Analysis. R. F.

- Stellingwerf and M. Donohoe. **314**, 252, 30-G8 (1987)
 The Baade-Wesselink Method and the Distances to RR Lyrae Stars. III. The Field Star SW Draconis. Rodney V. Jones, Bruce W. Carney, David W. Latham, and Robert L. Kurucz. **314**, 605, 36-B10 (1987)
 Observations of RR Lyrae Stars in the Halo of M31. Christopher J. Pritchett and Sidney van den Bergh. **316**, 517, 57-F2 (1987)
 The Distance to M5 from Its RR Lyrae Variables. J. G. Cohen and G. A. Gordon. **318**, 215, 81-C4 (1987)
 Modal Selection in Stellar Pulsators. II. Application to RR Lyrae Models. J. Robert Buchler and Géza Kovács. **318**, 232, 81-D7 (1987)
 Application of Time-dependent Fourier Analysis to Nonlinear Pulsational Stellar Models. G. Kovács, J. R. Buchler, and C. G. Davis. **319**, 247, 95-F6 (1987)
 Second-Overtone Models of RR Lyrae Stars. Richard B. Stothers. **319**, 260, 95-G5 (1987)
 Fourier Coefficients of the RR Lyrae Variables in NGC 6171. R. F. Stellingwerf and R. J. Dickens. **322**, 133, 139-D2 (1987)
Stars: RV Tauri
 Velocity Structure of Stellar Atmospheres: R Scuti. David Mozurkewich, R. D. Gehrz, K. H. Hinkle, and D. L. Lambert. **314**, 242, 30-F12 (1987)
 Period Doubling Bifurcations and Chaos in W Virginis Models. J. Robert Buchler and Géza Kovács. **320**, L57, 114-E3 (1987)
Stars: S-Type
 Carbon ($^{12}\text{C}/^{13}\text{C}$) and Oxygen ($^{16}\text{O}/^{17}\text{O}$) Isotopic Ratios in Seven Evolved Stars. James F. Dominy and George Wallerstein. **317**, 810, 74-G11 (1987)
 A Search for $^{14}\text{C}/^{16}\text{O}$ in the Atmospheres of Evolved Stars. Michael J. Harris and David L. Lambert. **318**, 868, 90-D12 (1987)
 Neutron-Exposure Variations in MS and S Stars, and the Implications for s-Process Nucleosynthesis. Verne V. Smith, David L. Lambert, and Andrew McWilliam. **320**, 862, 119-C3 (1987)
Stars: Semiregular Variables
 Period Doubling Bifurcations and Chaos in W Virginis Models. J. Robert Buchler and Géza Kovács. **320**, L57, 114-E3 (1987)
Stars: Spectral Classification
 An Atlas of 12 Rather Subtle Composite Spectra. Christopher J. Corbally. **63**, 365, 6-A2 (1987) (Abstr. in **312**, 966, 13-E7)
 Yellow Evolved Stars in Open Clusters. James R. Sowell. **64**, 241, 19-D5 (1987) (Abstr. in **315**, 732, 48-E13)
 The Early A Type Stars: Refined MK Classification, Confrontation with Strömgren Photometry, and the Effects of Rotation. R. O. Gray and R. F. Garrison. **65**, 581, 37-C1 (1987) (Abstr. in **322**, 1076, 151-G2)
Stars: Stellar Dynamics
 Shell Galaxies and Alternatives to the Dark Matter Hypothesis. Lars Hernquist and P. J. Quinn. **312**, 17, 1-B9 (1987)
 The Dynamical Fate of Wide Binaries in the Solar Neighborhood. Martin D. Weinberg, Stuart L. Shapiro, and Ira Wasserman. **312**, 367, 4-G9 (1987)
 Theoretical Implications of Wide Binary Observations. Ira Wasserman and Martin D. Weinberg. **312**, 390, 5-B4 (1987)
 Dynamical Friction and Evolution of the Luminosity Function in Clusters of Galaxies. A. Kashlinsky. **312**, 497, 8-C13 (1987)
 Non-Newtonian Forces and the Invisible Mass Problem. J. R. Kuhn and L. Kruglyak. **313**, 1, 15-A7 (1987)
 Dynamical Heating of Stars as a Fueling Mechanism for Active Galactic Nuclei. A. J. Allen and P. A. Hughes. **313**, 152, 16-F2 (1987)
 On Gravothermal Oscillations. Jeremy Goodman. **313**, 576, 23-B1 (1987)
 A Variational Principle for Determining the Oscillations and Stability of Stellar Systems. John Everson. **314**, 47, 28-E1 (1987)
 The Incidence of Close Binaries among Stars of Low Mass: Astrophysical Binaries. Arthur Young, Sina Sadjadi, and Eugene Harlan. **314**, 272, 31-B1 (1987)
 Blue Straggler Stars in the Globular Cluster NGC 5466. James M. Nemec and Hugh C. Harris. **316**, 172, 51-G7 (1987)
 On the Applicability of the Statistical Mechanical Theories of Violent Relaxation. Jes Madsen. **316**, 497, 57-D9 (1987)
 On Statistical Mechanical Theories of Violent Relaxation. Frank H. Shu. **316**, 502, 57-E1 (1987)
 Evolution of N-Body Systems with Tidally Captured Binaries through the Core Collapse Phase. Thomas S. Statler, Jeremiah P. Ostriker, and Haldan N. Cohn. **316**, 626, 58-G9 (1987)
 On the Antonov Criterion for Gravothermal Instability. J. F. Luciani and R. Pellat. **317**, 241, 66-E8 (1987)
 Nonuniqueness of Self-consistent Equilibrium Solutions for the Perfect Elliptic Disk. P. T. de Zeeuw, C. Hunter, and M. Schwarzschild. **317**, 607, 72-F11 (1987)
 Gravity in One Dimension: Selective Relaxation? Charles J. Reidl, Jr. and Bruce N. Miller. **318**, 248, 81-E10 (1987)

- The Formation and Evolution of Tidal Binary Systems. *Stephen L. W. McMillan, P. N. McDermott, and Ronald E. Taam.* **318**, 261, 81-F11 (1987)
- Simulations of Axisymmetric, Newtonian Star Clusters: Prelude to 2 + 1 General Relativistic Computations. *Stuart L. Shapiro and Saul A. Teukolsky.* **318**, 542, 86-G1 (1987)
- Massive Disk Formation from the Collision of a Main-Sequence Star with a White Dwarf in a Globular Cluster Core. *Noam Soker, Oded Regev, Mario Livio, and Michael M. Shara.* **318**, 760, 89-C4 (1987)
- Evolution of Globular Clusters Including a Degenerate Component. *Hyung Mok Lee.* **319**, 772, 103-D13 (1987)
- Dynamical Effects of Successive Mergers on the Evolution of Spherical Stellar Systems. *Hyung Mok Lee.* **319**, 801, 103-F14 (1987)
- Kinematics and Age of the Low-Mass X-Ray Binaries. *A. P. Cowley, J. B. Hutchings, David Crampton, and F. D. A. Hartwick.* **320**, 296, 111-C11 (1987)
- The Poynting-Robertson Effect of a Rotating Star. *Edwin T. Rusk.* **320**, 315, 111-E2 (1987)
- On Entropy and Stellar Systems. *Herwig Dejonghe.* **320**, 477, 114-F3 (1987)
- CCD Photometry of Globular Cluster Core Structure. I. NGC 6388, NGC 6624, and M15—One Flat Core and Two Cusps. *Phyllis M. Lugger, Haldan Cohn, Jonathan E. Grindlay, Charles D. Bailyn, and Paul Hertz.* **320**, 482, 114-F8 (1987)
- Distant Satellites as Probes of Our Galaxy's Mass Distribution. *Blane Little and Scott Tremaine.* **320**, 493, 114-G6 (1987)
- Self-consistent Models of Perfect Triaxial Galaxies. *Thomas S. Statler.* **321**, 113, 123-D1 (1987)
- The Collapse of Dense Star Clusters to Supermassive Black Holes: Binaries and Gravitational Radiation. *Gerald D. Quinlan and Stuart L. Shapiro.* **321**, 199, 124-D2 (1987)
- The Vertical Structure of Galactic Disks. *R. G. Carlberg.* **322**, 59, 138-E9 (1987)
- Globular Cluster Evolution in the Galaxy: A Global View. *David F. Chernoff and Stuart L. Shapiro.* **322**, 113, 139-B9 (1987)
- The Evolution and Final Disintegration of Spherical Stellar Systems in a Steady Galactic Tidal Field. *Hyung Mok Lee and Jeremiah P. Ostriker.* **322**, 123, 139-C6 (1987)
- Axisymmetric Shell Models with Stäckel Potentials. *Jeffrey L. Bishop.* **322**, 618, 146-E7 (1987)
- A Preliminary Survey of Collapsed Cores in the Magellanic Clouds' Globular Clusters. *G. Meylan and S. Djorgovski.* **322**, L91, 152-C10 (1987)
- The Structure of Young Star Clusters in the Large Magellanic Cloud. *Rebecca A. W. Elson, S. Michael Fall, and Kenneth C. Freeman.* **323**, 54, 153-F1 (1987)
- Three-dimensional Hydrodynamical Simulations of Stellar Collisions. I. Equal-Mass Main-Sequence Stars. *W. Benz and J. G. Hills.* **323**, 614, 161-D9 (1987)
- Collapsed Cores and the Structural Parameters of Old Large Magellanic Cloud Star Clusters. *Mario Mateo.* **323**, L41, 158-C12 (1987)
- Stars: Stellar Statistics**
- The Dynamical Fate of Wide Binaries in the Solar Neighborhood. *Martin D. Weinberg, Stuart L. Shapiro, and Ira Wasserman.* **312**, 367, 4-G9 (1987)
- The Wolf-Rayet Population in 30 Doradus and Its Surroundings. *Anthony F. J. Moffat, Virpi S. Niemela, M. M. Phillips, You-hua Chu, and Wilhelm Seggewiss.* **312**, 612, 9-E7 (1987)
- Chemical Evolution, Stellar Nucleosynthesis, and A Variable Star Formation Rate. *Keith A. Olive, Friedrich-Karl Thielemann, and James W. Truran.* **313**, 813, 25-F1 (1987)
- Implications for Solar-Type Binary Statistics of the Morbey-Griffin Improved Binary Analysis. *Helmut A. Abt.* **317**, 353, 67-F11 (1987)
- The Birthrate and Initial Spin Period of Single Radio Pulsars. *Ramesh Narayan.* **319**, 162, 94-G1 (1987)
- Binary System Parameters and the Hibernation Models of Cataclysmic Variables. *Mario Livio and Michael M. Shara.* **319**, 819, 104-A4 (1987)
- On the Distribution of Colors for Stars in the Ninth to Fifteenth Magnitude Range: Statistics and Implications for Galactic Structure. *Barry M. Lasker, Peter M. Garnavich, and Anne P. Reynolds.* **320**, 502, 115-A3 (1987)
- An Analysis of the Yale Bright Star Catalog. *John N. Bahcall, Stefano Casertano, and Kavan U. Ratnatunga.* **320**, 515, 115-B10 (1987)
- The Evolution of Asymptotic Giant Branch Stars in the Magellanic Clouds. III. The Problem of Intermediate-Mass Stars. *Jeremy Mould and Neill Reid.* **321**, 156, 124-A1 (1987)
- An Upper Limit to the Space Density of Short-period Noninteracting Binary White Dwarfs. *Edward L. Robinson and Allen W. Shafter.* **322**, 296, 141-B1 (1987)
- Properties of Evolved Mass-losing Stars in the Milky Way and Variations in the Interstellar Dust Composition. *Harley A. Thronson, Jr., William B. Latter, John H. Black, John Bully, and Perry Hacking.* **322**, 770, 148-C5 (1987)
- The Stellar Populations of Shapley Constellation III. *Neill Reid, Jeremy Mould, and Ian Thompson.* **323**, 433, 159-C11 (1987)
- A Flux-limited Sample of Galactic Carbon Stars. *M. J. Claussen, S. G. Kleinmann, R. R. Joyce, and M. Jura.* **65**, 385, 33-F1 (1987) (Abstr. in **321**, 1050, 136-A1)
- Stars: Subdwarfs**
- Detection of an Extremely Faint Emission Nebula Surrounding the Hot White Dwarf PG 0108 + 101. *R. J. Reynolds.* **315**, 234, 42-E3 (1987)
- The Stars with H α Missing. *Ronald A. Downes.* **316**, 763, 60-D8 (1987)
- Studies of Hot B Subdwarfs. V. Continuing Investigation of the C, N, and Si Abundance Patterns in the Atmospheres of sdB Stars. *R. Lamontagne, F. Wesemael, and G. Fontaine.* **318**, 844, 90-C1 (1987)
- Stars: Supergiants**
- CO Band Synthesis and the Interpretation of Band Strengths in Magellanic Cloud Supergiants. *Peter J. McGregor.* **312**, 195, 3-B2 (1987)
- Nitrogen and Sulfur Overabundances in the Population II Supergiant HD 46703. *Howard E. Bond and R. Earle Luck.* **312**, 203, 3-B10 (1987)
- An IRAS Survey of IR Excesses in G-Type Stars. *Sten F. Odenwald.* **314**, 830, 38-F2 (1987) (Orig. paper in **307**, 711, 104-F6)
- SiO Cooling Instability in the Envelopes of Cool Giant Stars. *David O. Muchmore, Joseph A. Nuth III, and Robert E. Stencel.* **315**, L141, 49-F10 (1987)
- The Relation between Apparent Temperature and Mass-Loss Rate in Hypergiant Eruptions. *Kris Davidson.* **317**, 760, 74-C12 (1987)
- Periodic Photospheric and Chromospheric Modulation in Alpha Orionis (Betelgeuse). *A. K. Dupree, S. L. Baltunas, E. F. Guinan, L. Hartmann, G. E. Nassisopoulos, and G. Sonneborn.* **317**, L86, 78-D4 (1987)
- The Use of the Brightest Blue Supergiants as Distance Indicators—Further Complications; OR The Brightest "Stars" Are Not Always Stars. *Roberta M. Humphreys and Marc Aaronson.* **318**, L69, 92-C14 (1987)
- An Analysis of the Photospheric Line Profiles in F, G, and K Supergiants. *David F. Gray and C. G. Toner.* **322**, 360, 141-G1 (1987)
- Yellow Evolved Stars in Open Clusters. *James R. Sowell.* **64**, 241, 19-D5 (1987) (Abstr. in **315**, 732, 48-E13)
- Stars: Supernovae**
- Discovery of Fast-moving Nitrogen-rich Ejecta in the Supernova Remnant Cassiopeia A. *Robert A. Fesen, Robert H. Becker, and William P. Blair.* **313**, 378, 19-B3 (1987)
- Chemical Evolution, Stellar Nucleosynthesis, and A Variable Star Formation Rate. *Keith A. Olive, Friedrich-Karl Thielemann, and James W. Truran.* **313**, 813, 25-F1 (1987)
- Supernovae 1983i and 1983v: Evidence for Abundance Variations in Type Ib Supernovae. *J. C. Wheeler, R. P. Harkness, E. S. Barker, A. L. Cochran, and D. Willis.* **313**, L69, 27-C11 (1987)
- Amplification and Polarization of Supernovae by Gravitational Lensing. *P. Schneider and Robert V. Wagoner.* **314**, 154, 29-F2 (1987)
- Neutrino Annihilation in Type II Supernovae. *Jeremy Goodman, Arnon Dar, and Shmuel Nussinov.* **314**, L7, 33-B9 (1987)
- The Light of the Supernova Outburst. IV. Lowered Energy for the Echo Model. *Willie R. Mackey.* **315**, 251, 42-F6 (1987)
- Supernovae versus Models of the Interstellar Medium and the Gaseous Halo. *Carl Heiles.* **315**, 555, 46-F10 (1987)
- The Bolometric Light Curve of a Carbon Deflagration Supernova. *James R. Graham.* **315**, 588, 47-B4 (1987)
- Neutrino Flows in Collapsing Stars: A Two-Fluid Model: Erratum. *J. Cooperstein, L. J. van den Horn, and E. A. Baron.* **315**, 729, 48-E10 (1987) (Orig. paper in **309**, 653, 128-D5)
- Infrared Photometry and Spectroscopy of Supernova 1986g in NGC 5128—Centaurus A. *Jay A. Frogel, Brooke Gregory, Kimiaki Kawara, Dave Lane, M. M. Phillips, Don Terndrup, Frederick Vrba, and Albert E. Whitford.* **315**, L129, 49-E11 (1987)
- Models for Type Ia Supernovae with Composition Inversions. *J. Craig Wheeler, Douglas Swartz, Zong-wei Li, and Peter G. Sutherland.* **316**, 733, 60-B5 (1987)
- Light Curves of Exploding Wolf-Rayet Stars. *R. Schaeffer, M. Cassé, and S. Cahen.* **316**, L31, 56-C8 (1987)
- High-Velocity Matter in a Classical Type I Supernova: The Demise of Type Ia Homogeneity. *David Branch.* **316**, L81, 62-C11 (1987)
- Metal-enhanced Galactic Winds. II. Radiative Cooling and Pressure Effects. *J. Patricia Vader.* **317**, 128, 65-C14 (1987)
- Supershells and Propagating Star Formation. *Richard McCray and Minas Kafatos.* **317**, 190, 66-B1 (1987)
- The Early Spectral Phase of Type Ib Supernovae: Evidence for Helium. *R. P. Harkness, J. C. Wheeler, B. Margon, R. A. Downes, R. P. Kirshner, A. Uemoto, E. S. Barker, A. L. Cochran, H. L. Dinerstein,*

Stars: Supernovae—Continued

- D. R. Garnett, and R. M. Leveault. **317**, 355, 67-F14 (1987)
- S-Matrix Calculation of the Triple-Alpha Reaction. Ikko Fushiki and D. Q. Lamb. **317**, 368, 68-A1 (1987)
- On Interacting Helium Star-White Dwarf Pairs as Supernova Precursors. Icko Iben, Jr., Ken'ichi Nomoto, Amedeo Tornambè, and Alexander V. Tutukov. **317**, 717, 73-G11 (1987)
- Inside Supernova 1987A. Richard McCray, J. Michael Shull, and Peter Sutherland. **317**, L73, 78-C7 (1987)
- Neutrinos from Gravitational Collapse. Ron Mayle, James R. Wilson, and David N. Schramm. **318**, 288, 82-A11 (1987)
- Supernova 1987A in the Large Magellanic Cloud: The Explosion of a $\sim 20 M_{\odot}$ Star Which Has Experienced Mass Loss? S. E. Woosley, P. A. Pinto, P. G. Martin, and Thomas A. Weaver. **318**, 664, 88-B11 (1987)
- The Effects of Neutrino Transport on the Collapse of Iron Stellar Cores. E. S. Myra, S. A. Bludman, Y. Hoffman, I. Lichenstadt, N. Sack, and K. A. Van Riper. **318**, 744, 89-B2 (1987)
- Subluminous Type I Supernovae: Their Theoretical Rate in Our Galaxy and in Ellipticals. A. Tornambè and F. Matteucci. **318**, L25, 85-B12 (1987)
- Deflagrating White Dwarfs and the Statistical Properties of Type I Supernovae. James R. Graham. **318**, L47, 92-B8 (1987)
- Calculated Gamma-Ray Line Fluxes from the Type II Supernova 1987A. K. W. Chan and R. E. Lingenfelter. **318**, L51, 92-B12 (1987)
- Convection and the Mechanism of Type II Supernovae. Adam Burrows. **318**, L57, 92-C3 (1987)
- Neutrinos from SN 1987A. Adam Burrows and James M. Lattimer. **318**, L63, 92-C8 (1987)
- Supernova Theory and Supernova 1987A. W. David Arnett. **319**, 136, 94-E1 (1987)
- Late-Time Neutrino Heating and Energetics of Stalled Shocks in Type II Supernovae. A. Ray and K. Kar. **319**, 143, 94-E9 (1987)
- Propagation of a Shock Wave in a Radiating Spherically Symmetric Distribution of Matter. L. Herrera and L. Núñez. **319**, 868, 104-D11 (1987)
- Supernova 1987A in the Large Magellanic Cloud: Initial Observations at Cerro Tololo. V. M. Blanco, B. Gregory, M. Hamuy, S. R. Heathcote, M. M. Phillips, N. B. Suntzeff, D. M. Terndrup, A. R. Walker, R. E. Williams, M. G. Pastoriza, T. Storch-Bergmann, and J. Matthews. **320**, 589, 116-B3 (1987)
- The Interstellar Medium toward Supernova 1987A. A. K. Dupree, R. P. Kirshner, G. E. Nassiopoulos, J. C. Raymond, and G. Sonneborn. **320**, 597, 116-B11 (1987)
- Ultraviolet Observations of SN 1987A. Robert P. Kirshner, George Sonneborn, D. Michael Crenshaw, and George E. Nassiopoulos. **320**, 602, 116-C2 (1987)
- Detection of a Very Bright Source Close to the LMC Supernova SN 1987A. P. Nissen, C. Papaliolos, M. Karouska, and R. Noyes. **320**, L15, 114-B4 (1987)
- Prospects for Observations of Nucleosynthetic Gamma-Ray Lines and Continuum from SN 1987A. Neil Gehrels, Crawford J. MacCallum, and Marvin Leventhal. **320**, L19, 114-B10 (1987)
- Blackbody Emissivity of Supernova 1987A and the Extragalactic Distance Scale. David Branch. **320**, L23, 114-C1 (1987)
- Supernova 1987A in the Large Magellanic Cloud: Possible s-Process Enhancements in the Progenitor. R. E. Williams. **320**, L117, 121-D4 (1987)
- Supernova 1987A: LTE Line Strengths as a Guide to Line Identifications. David Branch. **320**, L121, 121-D8 (1987)
- The Composite Image of Sanduleak -69° 202, Candidate Precursor to Supernova 1987A in the Large Magellanic Cloud. Nolan R. Walborn, Barry M. Lasker, Victoria G. Laidler, and You-Hua Chu. **321**, L41, 129-E4 (1987)
- Forbidden Lines of Si I: An Alternate Interpretation for an Infrared Emission Feature in the Spectrum of SN 1983N (M83). E. Oliva. **321**, L45, 129-E12 (1987)
- Neutrino Pair Energy Deposition in Supernovae. J. Cooperstein, L. J. van den Horn, and E. Baron. **321**, L129, 137-C7 (1987)
- Convection in Supernova Theory. H. A. Bethe, G. E. Brown, and J. Cooperstein. **322**, 201, 140-B3 (1987)
- Evolution of 8–10 M_{\odot} Stars toward Electron Capture Supernovae. II. Collapse of an O + Ne + Mg Core. Ken'ichi Nomoto. **322**, 206, 140-B8 (1987)
- Prospects for Gamma-Ray Line Observations of Individual Supernovae. Neil Gehrels, Marvin Leventhal, and Crawford J. MacCallum. **322**, 215, 140-C3 (1987)
- An Upper Limit to the Space Density of Short-period Noninteracting Binary White Dwarfs. Edward L. Robinson and Allen W. Shafter. **322**, 296, 141-B1 (1987)
- Resonant Neutrino Oscillations and Stellar Collapse. G. M. Fuller, R. W. Mayle, J. R. Wilson, and D. N. Schramm. **322**, 795, 148-E3 (1987)
- Spectral Flux from Low-Density Photospheres: Low-Temperature Results. Stephen Hershkowitz and Robert V. Wagoner. **322**, 967, 150-D11 (1987)
- Late Emission from SN 1987A. C. Fransson and R. A. Chevalier. **322**, L15, 145-B2 (1987)
- The Ionization Effects of Shock Breakout in SN 1987A. M. A. Dopita, S. J. Meatheringham, P. Nulsen, and P. R. Wood. **322**, L85, 152-C5 (1987)
- The Supernova Rate in Shapley-Ames Galaxies. Sidney van den Bergh, Robert D. McClure, and Robert Evans. **323**, 44, 153-E4 (1987)
- VLBI Observations of 23 Hot Spots in the Starburst Galaxy M82. N. Bartel, M. I. Ratner, A. E. E. Rogers, I. I. Shapiro, R. J. Bonometti, N. L. Cohen, M. V. Gorenstein, J. M. Marcaide, and R. A. Preston. **323**, 505, 160-B3 (1987)
- The Initial Neutrino Events from Supernovae as Evidence for Matter versus Antimatter. Alan V. Barnes, Thomas J. Weiler, and Sandip Pakvasa. **323**, L31, 158-C4 (1987)
- The Progenitor of SN 1987A: Spatially Resolved Ultraviolet Spectroscopy of the Supernova Field. George Sonneborn, Bruce Altner, and Robert P. Kirshner. **323**, L35, 158-C7 (1987)
- Light Echoes: Supernovae 1987A and 1986G. Bradley E. Schaefer. **323**, L47, 158-D3 (1987)
- Light Echoes: Type II Supernovae. Bradley E. Schaefer. **323**, L51, 158-D6 (1987)
- Stars: Symbiotic
- A Detailed Analysis of the Radio Emission from the Symbiotic Star RX Puppis. E. R. Seaquist and A. R. Taylor. **312**, 813, 11-G1 (1987)
- Spectroscopic Observations of the Symbiotic Binary RW Hydrae. Scott J. Kenyon and Telmo Fernandez-Castro. **316**, 427, 54-F9 (1987)
- Radio Emission from the Nova-like Variable AC Cancri and the Symbiotic Variable AG Draconis. Michael V. Torbett and Bel Campbell. **318**, L29, 85-C2 (1987)
- The (C III $\lambda 1909$ /Si III $\lambda 1892$) Ratio as a Diagnostic for Planetary Nebulae and Symbiotic Stars. Walter A. Feibelman and Lawrence H. Aller. **319**, 407, 97-E11 (1987)
- The Large-Scale Radio Structure of R Aquarii. J. M. Hollis, M. Kafatos, A. G. Michalitsianos, R. J. Oliveren, and F. Yusef-Zadeh. **321**, L55, 129-F6 (1987)
- Stars: T Tauri
- Anomalous Distribution of Axial Inclinations of T Tauri Stars. Wm. Bruce Weaver. **319**, L89, 107-E3 (1987)
- Stars: U Geminorum
- NSV 12615: An Eclipsing Cataclysmic Variable with Ultrashort Period. F. J. Jablonski and J. E. Steiner. **313**, 376, 19-A13 (1987)
- The Eclipses of Cataclysmic Variables. II. U Geminorum. E.-H. Zhang and Edward L. Robinson. **321**, 813, 133-D8 (1987)
- Stars: Variables
- Light Variability among the Late-Type B Pleiades Stars. Bernard J. McNamara. **312**, 778, 11-D7 (1987)
- Variable Radio Emission from the 4 Draconis System. Alexander Brown. **312**, L51, 14-C7 (1987)
- Pumping the Stellar Hydroxyl Maser. Dale F. Dickinson. **313**, 408, 19-D13 (1987)
- The Exotic Helium Variable PG 1346 + 082. M. A. Wood, D. E. Winget, R. E. Nather, Frederic V. Hessman, James Liebert, Donald W. Kurtz, F. Wesemael, and G. Wegner. **313**, 757, 25-B1 (1987)
- Velocity Structure of Stellar Atmospheres: R Scuti. David Mozurkewich, R. D. Gehrz, K. H. Hinkle, and D. L. Lambert. **314**, 242, 30-F12 (1987)
- Fourier Coefficients of Variable Stars. II. Light-Curve Analysis. R. F. Stellingwerf and M. Donohoe. **314**, 252, 30-G8 (1987)
- The Discovery of Six New Short-Period Variables in the Old Open Cluster NGC 188. Janusz Kaluzny and Michael M. Shara. **314**, 585, 36-A2 (1987)
- Discovery of Optical Circular Polarization in Lambda Andromedae. J. C. Kemp, G. D. Henson, D. J. Kraus, M. H. Dunaway, D. S. Hall, L. J. Boyd, R. M. Genet, E. F. Guinan, S. W. Wacker, and G. P. McCook. **317**, L29, 71-C2 (1987)
- Modal Selection in Stellar Pulsators. II. Application to RR Lyrae Models. J. Robert Buchler and Géza Kovács. **318**, 232, 81-D7 (1987)
- Radio Emission from the Nova-like Variable AC Cancri and the Symbiotic Variable AG Draconis. Michael V. Torbett and Bel Campbell. **318**, L29, 85-C2 (1987)
- A Dynamical Instability Model for the Period Gap of Cataclysmic Variable Binary Systems. Ronald E. Taam and P. N. McDermott. **319**, L83, 107-E8 (1987)
- Anomalous Distribution of Axial Inclinations of T Tauri Stars. Wm. Bruce Weaver. **319**, L89, 107-E3 (1987)
- The Perseus Flasher and Satellite Glints. Bradley E. Schaefer, Michael Barber, John J. Brooks, Allen DeForrest, Paul D. Maley, Norman W.

- McLeod III, Russ McNiel, Andrew J. Noymer, A. K. Presnell, Richard Schwartz, and Scott Whitney. **320**, 398, 112-D2 (1987)
- A New Formulation of the Starspot Model, and the Consequences of Starspot Structure. J. D. Dorren. **320**, 756, 118-A11 (1987)
- Discovery of High-Degree Nonradial Oscillations in Rapidly Rotating δ Scuti Stars? G. A. H. Walker, S. Yang, and G. G. Fahlgren. **320**, L139, 121-E9 (1987)
- The Activity, Variability, and Rotation of Lower Main-Sequence Hyades Stars. Richard R. Radick, D. T. Thompson, G. W. Lockwood, D. K. Duncan, and W. E. Baggett. **321**, 459, 127-B10 (1987)
- CAL 83: A Puzzling X-Ray Source in the Large Magellanic Cloud. David Crampton, A. P. Cowley, J. B. Hutchings, Paul C. Schmidtke, I. B. Thompson, and James Liebert. **321**, 745, 132-F3 (1987)
- Dynamical Mass Transfer in Cataclysmic Binaries. Fulvio Melia and D. Q. Lamb. **321**, L139, 137-D2 (1987)
- The Period Distribution and Evolution of Short-Period Cataclysmic Variables. Brian Warner and Mario Livio. **322**, L95, 152-C14 (1987)
- Stars: Visual Multiples**
- Theoretical Implications of Wide Binary Observations. Ira Wasserman and Martin D. Weinberg. **312**, 390, 5-B4 (1987)
- Finsen 342 and the Hyades Distance Modulus. Deane M. Peterson and Richard Solensky. **315**, 286, 43-A13 (1987)
- Low-Energy X-Ray Observations of the Wolf 630 System. Hugh M. Johnson. **316**, 458, 55-A12 (1987)
- The Binary Frequency of High-Velocity Field Dwarfs as Obtained with CCD Measures. Helmut A. Abt and Daryl W. Willmarth. **318**, 786, 89-E1 (1987)
- An Atlas of 12 Rather Subtle Composite Spectra. Christopher J. Corbally. **63**, 365, 6-A2 (1987) (Abstr. in **312**, 966, 13-E7)
- Micrometer Observations of Double Stars and New Pairs. XIII. W. D. Heintz. **65**, 161, 29-E11 (1987) (Abstr. in **319**, 1013, 106-A11)
- The Early A Type Stars: Refined MK Classification, Confrontation with Strömgren Photometry, and the Effects of Rotation. R. O. Gray and R. F. Garrison. **65**, 581, 37-C1 (1987) (Abstr. in **322**, 1076, 151-G2)
- Stars: Weak-Line**
- The Lithium Abundance in Halo Stars. L. M. Hobbs and Douglas K. Duncan. **317**, 796, 74-F10 (1987)
- The Binary Frequency of High-Velocity Field Dwarfs as Obtained with CCD Measures. Helmut A. Abt and Daryl W. Willmarth. **318**, 786, 89-E1 (1987)
- Stars: White Dwarfs**
- Magnetic Field Evolution in White Dwarfs. C. E. Wendell, H. M. Van Horn, and D. Sargent. **313**, 284, 18-A12 (1987)
- X-Ray and Ultraviolet Radiation from Accreting White Dwarfs. IV. Two-Temperature Treatment with Electron Thermal Conduction. J. N. Imamura, R. H. Durisen, D. Q. Lamb, and G. J. West. **313**, 298, 18-B14 (1987)
- The Impact of the Pressure Shift of Hydrogen Lines on "Relativistic" Masses of White Dwarfs. B. Grabowski, J. Madej, and J. Halenka. **313**, 750, 25-A8 (1987)
- The Exotic Helium Variable PG 1346 + 082. M. A. Wood, D. E. Winget, R. E. Nather, Frederic V. Hessman, James Liebert, Donald W. Kurtz, F. Wesemael, and G. Wegner. **313**, 757, 25-B1 (1987)
- A New Driving Mechanism for Stellar Pulsations. W. Dean Pesnell. **314**, 598, 36-B3 (1987)
- Off-Center Ignition of Nuclear Burning in Merging White Dwarfs. Yasushi Kawai, Hideyuki Saio, and Ken'ichi Nomoto. **315**, 229, 42-D12 (1987)
- Detection of an Extremely Faint Emission Nebula Surrounding the Hot White Dwarf PG 0108 + 101. R. J. Reynolds. **315**, 234, 42-E3 (1987)
- The DBA White Dwarf Stars in the Palomar-Green Sample. Harry L. Shipman, James Liebert, and Richard F. Green. **315**, 239, 42-E8 (1987)
- An Independent Method for Determining the Age of the Universe. D. E. Winget, C. J. Hansen, James Liebert, H. M. Van Horn, G. Fontaine, R. E. Nather, S. O. Kepler, and D. Q. Lamb. **315**, L77, 49-B1 (1987)
- New Evolutionary Relationships for Magellanic Cloud Planetary Nebulae. Michael A. Dopita, Stephen J. Meatheringham, Peter R. Wood, B. Louise Webster, David H. Morgan, and Holland C. Ford. **315**, L107, 49-D2 (1987)
- Two Extreme Examples of Compact Pulsars: PG 1115 + 158 and PG 1351 + 489. D. E. Winget, R. E. Nather, and J. Allen Hill. **316**, 305, 53-C11 (1987)
- Einstein Observations of EF Eridani (2A 0311 - 227), the Textbook Example of AM Herculis-type Systems. K. Beuermann, L. Stella, and J. Patterson. **316**, 360, 54-A6 (1987)
- BE Ursae Majoris: A Detached Binary with a Unique Reprocessing Spectrum. Donald H. Ferguson, James Liebert, Roc Cutri, Richard F. Green, S. P. Willner, João E. Steiner, and Susan Tokarz. **316**, 399, 54-D4 (1987)
- Neutrino-Pair Bremsstrahlung in Dense Stars. V. Partially Degenerate Electrons. Hiroharu Murakata, Yasuhiro Kohyama, and Naoki Itoh. **316**, 708, 59-G3 (1987)
- Models for Type Ia Supernovae with Composition Inversions. J. Craig Wheeler, Douglas Swartz, Zong-wei Li, and Peter G. Sutherland. **316**, 733, 60-B5 (1987)
- On the Evolution of Tidal Capture X-Ray Binaries: 4U 2127 + 12 (M15) to 4U 1820 - 30 (NGC 6624). Charles D. Bailyn and Jonathan E. Grindlay. **316**, L25, 56-C3 (1987)
- Pulsations of White Dwarf Stars with Thick Hydrogen or Helium Surface Layers. Arthur N. Cox, Sumner G. Starrfield, Russell B. Kidman, and W. Dean Pesnell. **317**, 303, 67-B14 (1987)
- On Interacting Helium Star-White Dwarf Pairs as Supernova Precursors. Icko Iben, Jr., Ken'ichi Nomoto, Amedeo Tornambè, and Alexander V. Tutukov. **317**, 717, 73-G11 (1987)
- Viscosity of Dense Matter. Naoki Itoh, Yasuhiro Kohyama, and Hideo Tekeuchi. **317**, 733, 74-A13 (1987)
- Spin-up and Mixing in Accreting White Dwarfs. Mario Livio and James W. Truran. **318**, 316, 82-C12 (1987)
- Absorption Features from the Accretion Column in E1405 - 451. D. T. Wickramasinghe, I. R. Tuohy, and N. Visvanathan. **318**, 326, 82-D8 (1987)
- Deflagrating White Dwarfs and the Statistical Properties of Type I Supernovae. James R. Graham. **318**, L47, 92-B8 (1987)
- Lower Bounds on the Masses of Rapidly Rotating White Dwarfs. G. Channugam, Meenakshi Rao, and Joel E. Tohline. **319**, 188, 95-A13 (1987)
- Ultraviolet and Visual Spectroscopy of DB White Dwarfs. G. Wegner and E. P. Nelan. **319**, 916, 105-A5 (1987)
- A Search for Brown Dwarfs and Late M Dwarfs in the Hyades and the Pleiades. B. Zuckerman and E. E. Becklin. **319**, L99, 107-F9 (1987)
- Collapsing White Dwarfs. E. Baron, J. Cooperstein, S. Kahana, and K. Nomoto. **320**, 304, 111-D5 (1987)
- The Rotationally Modulated Zeeman Spectrum at Nearly 10^9 Gauss of the White Dwarf PG 1031 + 234. William B. Latter, Gary D. Schmidt, and Richard F. Green. **320**, 308, 111-D9 (1987)
- Stellar Accretion of Matter Possessing Angular Momentum. G. Siegfried Kutter and Warren M. Sparks. **321**, 386, 126-D7 (1987)
- Nuclear Runaways in a C/O White Dwarf Accreting H-rich Material Possessing Angular Momentum. Warren M. Sparks and G. Siegfried Kutter. **321**, 394, 126-E1 (1987)
- PG 0122 + 200: A New Member of the GW Virginis (PG 1159 - 035) Class of Extremely Hot Pulsating White Dwarfs. Howard E. Bond and Albert D. Grauer. **321**, L123, 137-C1 (1987)
- Synchronization-induced Period Gaps and Ultra-Short Periods in Magnetic Cataclysmic Binaries. D. Q. Lamb and Fulvio Melia. **321**, L133, 137-C11 (1987)
- Dynamical Mass Transfer in Cataclysmic Binaries. Fulvio Melia and D. Q. Lamb. **321**, L139, 137-D2 (1987)
- Wave Energy in White Dwarf Atmospheres. I. Magnetohydrodynamic Energy Spectra for Homogeneous DB and Layered DA Stars. Zdzisław E. Musielak. **322**, 234, 140-D8 (1987)
- Axion Bremsstrahlung in Dense Stars. Masayuki Nakagawa, Yasuhiro Kohyama, and Naoki Itoh. **322**, 291, 141-A9 (1987)
- An Upper Limit to the Space Density of Short-period Noninteracting Binary White Dwarfs. Edward L. Robinson and Allen W. Shafter. **322**, 296, 141-B1 (1987)
- Selective Mass Loss, Abundance Anomalies, and Helium-rich Stars. G. Michaud, J. Dupuis, G. Fontaine, and T. Montmerle. **322**, 302, 141-B7 (1987)
- Determination of Photospheric Helium Abundances for the Hot White Dwarfs LB 1663 and CD - 38°10980 from EXOSAT Soft X-Ray Photometry. F. B. S. Paerels, J. Heise, S. M. Kahn, and R. D. Rogers. **322**, 315, 141-C6 (1987)
- Neutrino-Pair Bremsstrahlung in Dense Stars. IV. Phonon Contributions in the Crystalline Lattice Phase: Erratum. Naoki Itoh, Yasuhiro Kohyama, Noriyoshi Matsumoto, and Midori Seki. **322**, 584, 144-C9 (1987) (Orig. paper in **285**, 304, 113-C2)
- Gravitational Redshift and Mass-Radius Relation in White Dwarfs. D. Koester. **322**, 852, 149-B8 (1987)
- The Discovery of Near-Infrared Polarized Cyclotron Emission in the Intermediate Polar BG Canis Minoris. Steven C. West, Graham Berriman, and Gary D. Schmidt. **322**, L35, 145-C7 (1987)
- A Search for Pulsating Stars Similar to PG 1159 - 035 and K1-16. Albert D. Grauer, Howard E. Bond, James Liebert, Thomas A. Fleming, and Richard F. Green. **323**, 271, 156-A10 (1987)
- On the Stability of the 13.2 Minute Oscillation of V1223 Sagittarii. F. Jablonski and J. E. Steiner. **323**, 672, 162-B2 (1987)

Stars: White Dwarfs—Continued

- A Catalog of Spectroscopically Identified White Dwarfs. *George P. McCook and Edward M. Sion*. **65**, 603, 37-E2 (1987) (Abstr. in **322**, 1076, 151-G2)

Stars: Winds

- Mass Loss from FU Orionis Objects. *Ken Crowell, L. Hartmann, and E. H. Aretz*. **312**, 227, 3-D6 (1987)
- Winds from Rotating, Magnetic, Hot Stars. III. The Azimuthal Velocity and Magnetic Force. *K. B. MacGregor and D. B. Friend*. **312**, 659, 10-B6 (1987)
- Quasi-static Winds from Neutron Stars. *Paul C. Joss and Fulvio Melia*. **312**, 700, 10-E7 (1987)
- A Detailed Analysis of the Radio Emission from the Symbiotic Star RX Puppis. *E. R. Seaquist and A. R. Taylor*. **312**, 813, 11-G1 (1987)
- Compact Continuum Radio Sources in the Orion Nebula. *Guido Garay, James M. Moran, and Mark J. Reid*. **314**, 535, 35-D2 (1987)
- The "SEI" Method for Accurate and Efficient Calculations of Line Profiles in Spherically Symmetric Stellar Winds. *H. J. G. L. M. Lamers, M. Cerruti-Sola, and M. Perinotto*. **314**, 726, 37-E6 (1987)
- Two Binary Cycles of GX 301 - 2. *Richard E. Rothschild and Yang Soong*. **315**, 154, 41-F6 (1987)
- Infrared Line Observations of Low-Luminosity Outflow Sources. *Howard A. Smith, J. Fischer, T. R. Geballe, and P. R. Schwartz*. **316**, 265, 52-G12 (1987)
- High-Luminosity Accretion in Wind-driven Binary X-Ray Sources. *Cheng Ho and Jonathan Arons*. **316**, 283, 53-B3 (1987)
- Bipolar Flows, Molecular Gas Disks, and the Collapse and Accretion of Rotating Interstellar Clouds. *Alan P. Boss*. **316**, 721, 60-A6 (1987)
- Polarization, Jets, and the Distribution of Circumstellar Dust around T Tauri Stars and Other Young Infrared Sources. *Pierre Bastien*. **317**, 231, 66-D12 (1987)
- Polarization of Light Scattered from the Winds of Early-Type Stars. *J. P. Cassinelli, K. H. Nordsieck, and M. A. Murison*. **317**, 290, 67-B1 (1987)
- Ultraviolet Observations of Extensive Variability in the Stellar Wind of ξ Persei. *Raman K. Prinja, Ian D. Howarth, and Huib F. Henrichs*. **317**, 389, 68-B11 (1987)
- Rapid Variability of P Cygni Lines in Massive X-Ray Binaries. *Timothy R. Kallman, Richard McCray, and G. Mark Voit*. **317**, 746, 74-B12 (1987)
- High-Resolution Images of the L1551 Bipolar Outflow: Evidence for an Expanding, Accelerated Shell. *G. H. Moriarty-Schieven, R. L. Snell, S. E. Strom, F. P. Schloerb, K. M. Strom, and G. L. Grasdale*. **319**, 742, 103-B6 (1987)
- On the Origin of Kepler's Supernova Remnant. *Rino Bandiera*. **319**, 885, 104-F1 (1987)
- Highly Ionized Stellar Winds in Be Stars: The Evidence for Aspect Dependence. *C. A. Grady, K. S. Bjorkman, and T. P. Snow*. **320**, 376, 112-B8 (1987)
- A New Cometary Nebula in Cygnus. *Th. Neckel and H. J. Staudte*. **320**, 1145, 121-F1 (1987)
- Radiatively Driven Winds from Magnetic, Fast-rotating Stars: Wolf-Rayet Stars? *Steven Nerney and S. T. Suess*. **321**, 355, 126-B3 (1987)
- A Survey of IRAS Point Sources in Taurus for High-Velocity Molecular Gas. *Mark H. Heyer, Ronald L. Snell, Paul F. Goldsmith, and Philip C. Myers*. **321**, 370, 126-C3 (1987)
- Fluctuation of Wind-driven Accretion in X-Ray Binaries. *Cheng Ho and Jonathan Arons*. **321**, 404, 126-E11 (1987)
- Interaction of the High-Density Gas with the Bipolar Outflow in Cepheus A. *José M. Torrelles, Paul T. P. Ho, Luis F. Rodriguez, Jorge Cantó, and James M. Moran*. **321**, 884, 134-C4 (1987)
- Radio Recombination Lines from Fast Shocks in Molecular Clouds, with Application to Bipolar Flows. *Christopher F. McKee and David J. Hollenbach*. **322**, 275, 140-G7 (1987)
- Polarization Variability among Wolf-Rayet Stars. I. Linear Polarization of a Complete Sample of Southern Galactic WC Stars. *Nicole St-Louis, Laurent Drissen, Anthony F. J. Moffat, Pierre Bastien, and Santiago Tapia*. **322**, 870, 149-C13 (1987)
- Polarization Variability among Wolf-Rayet Stars. II. Linear Polarization as a Complete Sample of Southern Galactic WN Stars. *Laurent Drissen, Nicole St-Louis, Anthony F. J. Moffat, and Pierre Bastien*. **322**, 888, 149-E5 (1987)
- Are There Stellar Winds in the Hot Stars of M31? *J. B. Hutchings, Philip Massey, and L. Bianchi*. **322**, L79, 152-B13 (1987)
- Cosmic-Ray-modified Stellar Winds. I. Solution Topologies and Singularities. *C. M. Ko and G. M. Webb*. **323**, 657, 162-A1 (1987)
- IUE Observations of the Dwarf Nova HL Canis Majoris and the Winds of Cataclysmic Variables. *Christopher W. Mauche and John C. Raymond*. **323**, 690, 162-C6 (1987)
- An Empirical Model for the Wolf-Rayet Star HD 50896. *D. J. Hillier*. **63**, 965, 15-G12 (1987) (Abstr. in **314**, 833, 38-F9)

Stars: Wolf-Rayet

- The Wolf-Rayet Population in 30 Doradus and Its Surroundings. *Anthony F. J. Moffat, Virpi S. Niemela, M. M. Phillips, You-hua Chu, and Wilhelm Seggewiss*. **312**, 612, 9-E7 (1987)
- An Eight-Year Spectroscopic Orbit for the WC7 + O4 Wolf-Rayet Binary HD 193793: Toward Solving the Mystery of the Infrared Outbursts. *Anthony F. Moffat, Robert Lamontagne, Peredur M. Williams, Jiri Horn, and Wilhelm Seggewiss*. **312**, 807, 11-F8 (1987)
- On the Lack of Evidence for Nonradial Pulsation in Wolf-Rayet Stars. *Jaymie M. Matthews and Martin Beech*. **313**, L25, 21-B12 (1987)
- Light Curves of Exploding Wolf-Rayet Stars. *R. Schaeffer, M. Cassé, and S. Cahen*. **316**, L31, 56-C8 (1987)
- On the Chemical Homogeneity of the 30 Doradus H II Region and a Local Enrichment by Wolf-Rayet Stars. *Michael Rosa and John S. Mathis*. **317**, 163, 65-F11 (1987)
- Wolf-Rayet Stars in the Andromeda Galaxy. *Anthony F. J. Moffat and Michael M. Shara*. **320**, 266, 111-A9 (1987)
- The Einstein View of the Wolf-Rayet Stars. *A. M. T. Pollock*. **320**, 283, 111-B12 (1987)
- Radiatively Driven Winds from Magnetic, Fast-rotating Stars: Wolf-Rayet Stars? *Steven Nerney and S. T. Suess*. **321**, 355, 126-B3 (1987)
- Optical Spectroscopy of IRAS Sources with Infrared Emission Bands: IRAS 21282 + 5050 and the Diffuse Interstellar Bands. *Martin Cohen and B. F. Jones*. **321**, L151, 137-E1 (1987)
- Polarization Variability among Wolf-Rayet Stars. I. Linear Polarization of a Complete Sample of Southern Galactic WC Stars. *Nicole St-Louis, Laurent Drissen, Anthony F. J. Moffat, Pierre Bastien, and Santiago Tapia*. **322**, 870, 149-C13 (1987)
- Polarization Variability among Wolf-Rayet Stars. II. Linear Polarization as a Complete Sample of Southern Galactic WN Stars. *Laurent Drissen, Nicole St-Louis, Anthony F. J. Moffat, and Pierre Bastien*. **322**, 888, 149-E5 (1987)
- Atmospheric Eclipses in the SMC Wolf-Rayet Eclipsing Binary HD 5980: The Heavy versus the Light Metal Abundance. *G. Koenigsberger, A. F. J. Moffat, and L. H. Auer*. **322**, L41, 145-C12 (1987)
- Modeling the Extended Atmospheres of WN Stars. *D. J. Hillier*. **63**, 947, 15-F8 (1987) (Abstr. in **314**, 833, 38-F9)
- An Empirical Model for the Wolf-Rayet Star HD 50896. *D. J. Hillier*. **63**, 965, 15-G12 (1987) (Abstr. in **314**, 833, 38-F9)
- An Atlas of Optical Spectrophotometry of Wolf-Rayet Carbon and Oxygen Stars. *Ana V. Torres and Philip Massey*. **65**, 459, 35-A2 (1987) (Abstr. in **321**, 1053, 136-A4)
- Stars: W Ursae Majoris**
- The Discovery of Six New Short-Period Variables in the Old Open Cluster NGC 188. *Janusz Kaluzny and Michael M. Shara*. **314**, 585, 36-A2 (1987)
- The Problem of the W-Type Light Curves of W Ursae Majoris. *Albert P. Linnell*. **316**, 389, 54-C8 (1987)
- RW Comae Berenices. III. Light Curve Solution and Absolute Parameters. *E. F. Milone, R. E. Wilson, and B. J. Hrivnak*. **319**, 325, 96-E3 (1987)
- Stars: X-Rays**
- Model Atmospheres for Cooling Neutron Stars. *Roger W. Romani*. **313**, 718, 24-E13 (1987)
- X-Ray Sources in Regions of Star Formation. II. The Pre-Main-Sequence G Star HD 283572. *F. M. Walter, A. Brown, J. L. Linsky, A. E. Rydgren, F. Vrba, M. Roth, L. Carrasco, P. F. Chugainov, N. I. Shakovskaya, and C. L. Imhoff*. **314**, 297, 31-D2 (1987)
- Einstein Observatory Survey of X-Ray Emission from Solar-Type Stars: The Late F and G Dwarf Stars. *A. Maggio, S. Sciortino, G. S. Vaiana, P. Majer, J. Bookbinder, L. Golub, F. R. Harnden, Jr., and R. Rosner*. **315**, 687, 48-B8 (1987)
- Low-Energy X-Ray Observations of the Wolf 630 System. *Hugh M. Johnson*. **316**, 458, 55-A12 (1987)
- On the Evolution of Tidal Capture X-Ray Binaries: 4U 2127 + 12 (M15) to 4U 1820 - 30 (NGC 6624). *Charles D. Bailyn and Jonathan E. Grindlay*. **316**, L25, 56-C3 (1987)
- Effect of an Electron Scattering Cloud on X-Ray Oscillations Produced by Beaming. *J. Brainerd and F. K. Lamb*. **317**, L33, 71-C6 (1987)
- Power Spectra of Quasi-periodic Oscillations in Luminous X-Ray Stars. *N. Shibazaki and F. K. Lamb*. **318**, 767, 89-C11 (1987)
- The Einstein View of the Wolf-Rayet Stars. *A. M. T. Pollock*. **320**, 283, 111-B12 (1987)
- Optical and X-Ray Radiation from Fast Pulsars: Effects of Duty Cycle and Spectral Shape. *F. Pacini and M. Salati*. **321**, 447, 127-A12 (1987)
- Determination of Photospheric Helium Abundances for the Hot White Dwarfs LB 1663 and CD - 38°10980 from EXOSAT Soft X-Ray Photometry. *F. B. S. Paerels, J. Heise, S. M. Kahn, and R. D. Rogers*. **322**, 315, 141-C6 (1987)

- Rapid, Low-Level X-Ray Variability in Active Late-Type Dwarfs. Carol W. Ambruster, Salvatore Sciortino, and L. Golub. **65**, 273, 32-B4 (1987) (Abstr. in **319**, 1012, 106-A10)
- Sun: Abundances**
 A Determination of the $^3\text{He}/\text{H}$ Ratio in the Solar Photosphere from Flare Gamma-Ray Line Observations. X.-M. Hua and R. E. Lindegfelter. **319**, 555, 99-C14 (1987)
 The Solar Boron Abundance. R. C. M. Learner and C. J. Harris. **320**, 926, 120-A3 (1987)
- Sun: Activity**
 Fast Downflows in the Solar Transition Region Explained. A. N. McClymont and I. J. D. Craig. **312**, 402, 5-C2 (1987)
 SMM Observations of Si IV and O IV Bursts in Solar Active Regions. Marion Hayes and R. A. Shine. **312**, 943, 13-C6 (1987)
 The Cooling Time Scales of Growing Sunspots. Dean-Yi Chou. **312**, 955, 13-D5 (1987)
 Chromospheric Ca II K-Line Variations in the Sun as a Star over a Solar Cycle. K. R. Sivaraman, Jagdev Singh, S. P. Bagare, and S. S. Gupta. **313**, 456, 20-A6 (1987)
 Evidence in Meteorites for an Active Early Sun. M. W. Caffee, C. M. Hohenberg, T. D. Swindle, and J. N. Goswami. **313**, L31, 21-C3 (1987)
 Objective Characterization of Stellar Activity Cycles. I. Methods and Solar Cycle Analyses. Ronald L. Gilliland and Sallie L. Baliunas. **314**, 766, 38-A6 (1987)
 Distribution of Flares on the Sun: Superactive Regions and Active Zones of 1980-1985. Taiel Bai. **314**, 795, 38-C9 (1987)
 Solar Luminosity Variation. V. The Photospheric Lines 1976-1985. W. Livingston and L. Wallace. **314**, 808, 38-D8 (1987)
 Spectroscopic Evidence for a Moving Pattern of Azimuthal Rolls on the Sun. Herschel B. Snodgrass. **316**, L91, 62-D8 (1987)
 Multifrequency Observations of a Solar Active Region during a Partial Eclipse. Dale E. Gary and G. J. Hurford. **317**, 522, 69-E12 (1987)
 Solar Cycle Study of Interplanetary Lyman-Alpha Variations: PIONEER VENUS Orbiter Sky Background Results. J. M. Ajello, A. I. Stewart, G. E. Thomas, and A. Graps. **317**, 964, 76-F5 (1987)
 Ne IX Emission-Line Ratios in Solar Active Regions. F. P. Keenan, D. L. McKenzie, S. M. McCann, and A. E. Kingston. **318**, 926, 91-B2 (1987)
 Periodicities of the Flare Occurrence Rate in Solar Cycle 19. T. Bai. **318**, L85, 92-E6 (1987)
 Is Solar Neutrino Capture Rate Correlated with Sunspot Number? J. N. Bahcall, G. B. Field, and W. H. Press. **320**, L69, 114-F1 (1987)
- Sun: Atmosphere**
 Fast Downflows in the Solar Transition Region Explained. A. N. McClymont and I. J. D. Craig. **312**, 402, 5-C2 (1987)
 The Formation of Current Sheets in the Solar Atmosphere. Ellen G. Zweibel and He-Sheng Li. **312**, 423, 5-D9 (1987)
 Flux Tube Models of Solar Plages. Stephen R. Walton. **312**, 909, 12-G7 (1987)
 Solar Luminosity Variation. V. The Photospheric Lines 1976-1985. W. Livingston and L. Wallace. **314**, 808, 38-D8 (1987)
 On the Generation of Magnetohydrodynamic Waves in a Stratified and Magnetized Fluid. I. Vertical Propagation. Z. E. Musielak and R. Rosner. **315**, 371, 44-A5 (1987)
 The Structure and Dissipation of Forced Current Sheets in the Solar Atmosphere. Tzihong Chiueh and Ellen G. Zweibel. **317**, 900, 76-A7 (1987)
 Incompressible Magnetohydrodynamic Surface Waves: Nonlinear Aspects. Joseph V. Hollweg. **317**, 918, 76-B11 (1987)
 Solar Brightness Temperature at Submillimeter Wavelengths. R. T. Boreiko and T. A. Clark. **318**, 445, 83-G2 (1987)
 On the Unresolved Fine Structures of the Solar Atmosphere. II. The Temperature Region 2×10^5 K- 5×10^5 K. U. Feldman. **320**, 426, 112-F2 (1987)
 Nonlocal Thermal Transport in Solar Flares. Judith T. Karpen and C. Richard DeVore. **320**, 904, 119-F3 (1987)
 The α -Effect Generated by Random Alfvén Waves in a Stratified Atmosphere and Particle Acceleration. Tomikazu Namikawa, Hiromitsu Hamabata, and Hiroyuki Wada. **323**, 414, 157-F3 (1987)
- Sun: Atmospheric Motions**
 Fast Downflows in the Solar Transition Region Explained. A. N. McClymont and I. J. D. Craig. **312**, 402, 5-C2 (1987)
 Simultaneous Measurements of Sunspot Umbral Oscillations in the Photosphere, Chromosphere, and Transition Region. John H. Thomas, Bruce W. Lites, Joseph B. Gurman, and Edwin F. Ladd. **312**, 457, 5-G9 (1987)
 Spectroscopic Evidence for a Moving Pattern of Azimuthal Rolls on the Sun. Herschel B. Snodgrass. **316**, L91, 62-D8 (1987)
 Velocity Fields in a Low-Latitude Coronal Hole: Results from the Solar Maximum Mission. D. J. Mullan and W. L. Waldron. **317**, 487, 69-C5 (1987)
 The Magnetic and Velocity Structure Adjacent to Solar Active Regions. R. Grant Athay and J. A. Klimchuk. **318**, 437, 83-F7 (1987)
 Solar Transition Region and Coronal Response to Heating Rate Perturbations. John T. Mariska. **319**, 465, 98-C3 (1987)
 Acoustic Absorption by Sunspots. D. C. Braun, T. L. Duval, Jr., and B. J. Labonte. **319**, L27, 100-C9 (1987)
 On the Large-Scale Dynamics and Magnetic Structure of Solar Active Regions. James A. Klimchuk. **323**, 368, 157-B1 (1987)
- Sun: Chromosphere**
 SMM Observations of Si IV and O IV Bursts in Solar Active Regions. Marion Hayes and R. A. Shine. **312**, 943, 13-C6 (1987)
 Chromospheric Ca II K-Line Variations in the Sun as a Star over a Solar Cycle. K. R. Sivaraman, Jagdev Singh, S. P. Bagare, and S. S. Gupta. **313**, 456, 20-A6 (1987)
 Submillimeter Diagnostics of the Response of the Solar Chromosphere to Compressional Waves. C. Lindsey and T. Roellig. **313**, 877, 26-D1 (1987)
 Objective Characterization of Stellar Activity Cycles. I. Methods and Solar Cycle Analyses. Ronald L. Gilliland and Sallie L. Baliunas. **314**, 766, 38-A6 (1987)
 Nonpotential Features Observed in the Magnetic Field of an Active Region. G. A. Gary, R. L. Moore, M. J. Hagyard, and Bernhard M. Haesch. **314**, 782, 38-B8 (1987)
 Observation and Oscillatory Properties of Mesostructures in the Solar Chromosphere. L. Damé and M. Martić. **314**, L15, 33-C2 (1987)
 Nonlinear Evolution of Radiation-driven Thermally Unstable Fluids. R. B. Dahlburg, C. R. DeVore, J. M. Picone, J. T. Mariska, and J. T. Karpen. **315**, 385, 44-B5 (1987)
 Evidence for Gentle Chromospheric Evaporation during the Gradual Phase of Large Solar Flares. B. Schmieder, T. G. Forbes, J. M. Malherbe, and M. E. Machado. **317**, 956, 76-E8 (1987)
 LTE Modeling of Inhomogeneous Chromospheric Structure Using High-Resolution Limb Observation. C. Lindsey. **320**, 893, 119-E9 (1987)
 A Solar Chromosphere and Spicule Model Based on Far-Infrared Limb Observations. D. Braun and C. Lindsey. **320**, 898, 119-E11 (1987)
 Impulsive H α Diagnostics of Electron-Beam-Heated Solar Flare Model Chromospheres. Richard C. Canfield and Kenneth G. Gayley. **322**, 999, 150-G10 (1987)
- Sun: Corona**
 Fast Downflows in the Solar Transition Region Explained. A. N. McClymont and I. J. D. Craig. **312**, 402, 5-C2 (1987)
 Formation of a Solar Coronal Transient with Forerunner. Erast B. Gliner and Vladimir A. Osherovich. **312**, 412, 5-C12 (1987)
 The Formation of Current Sheets in the Solar Atmosphere. Ellen G. Zweibel and He-Sheng Li. **312**, 423, 5-D9 (1987)
 The Topology of Force-Free Magnetic Fields and Its Implications for Coronal Activity. Spiro K. Antiochos. **312**, 886, 12-E10 (1987)
 Current-driven Magnetohydrodynamic Thermal Instabilities in Sheared Fields. G. Bodo, A. Ferrari, S. Massaglia, and R. Rosner. **313**, 432, 19-F10 (1987)
 Objective Characterization of Stellar Activity Cycles. I. Methods and Solar Cycle Analyses. Ronald L. Gilliland and Sallie L. Baliunas. **314**, 766, 38-A6 (1987)
 Nonpotential Features Observed in the Magnetic Field of an Active Region. G. A. Gary, R. L. Moore, M. J. Hagyard, and Bernhard M. Haesch. **314**, 782, 38-B8 (1987)
 Solar Wind Diagnostics from Doppler-enhanced Scattering. Giancarlo Noci, John L. Kohl, and George L. Withbroe. **315**, 706, 48-D1 (1987)
 The Plasma and Magnetic Field Properties of Coronal Loops Observed at High Spatial Resolution. D. F. Webb, G. D. Holman, J. M. Davis, M. R. Kundu, and R. K. Shevgaonkar. **315**, 716, 48-D11 (1987)
 Velocity Fields in a Low-Latitude Coronal Hole: Results from the Solar Maximum Mission. D. J. Mullan and W. L. Waldron. **317**, 487, 69-C5 (1987)
 Heating of the Solar Corona by the Resonant Absorption of Alfvén Waves. Joseph M. Davila. **317**, 514, 69-E4 (1987)
 Multifrequency Observations of a Solar Active Region during a Partial Eclipse. Dale E. Gary and G. J. Hurford. **317**, 522, 69-E12 (1987)
 The Structure and Dissipation of Forced Current Sheets in the Solar Atmosphere. Tzihong Chiueh and Ellen G. Zweibel. **317**, 900, 76-A7 (1987)
 Why Coronal Loops Cannot Exist without Solar Gravity. I. J. D. Craig and A. N. McClymont. **318**, 421, 83-E5 (1987)
 Rotation of the Coronal Magnetic Fields. J. T. Hoeksema and P. H. Scherrer. **318**, 428, 83-E12 (1987)
 Solar Transition Region and Coronal Response to Heating Rate Perturbations. John T. Mariska. **319**, 465, 98-C3 (1987)
 The Origin of Rigidly Rotating Magnetic Field Patterns on the Sun. N. R. Sheeley, Jr., A. G. Nash, and Y.-M. Wang. **319**, 481, 98-D5 (1987)
 Radio Evidence for a Magnetic Mirror Effect on Beams of Subrelativistic

- Sun: Corona—Continued**
 tic Electrons in the Solar Corona. C. Caroubalos, M. Poquérusse, J.-L. Bourget, and R. Crépél. **319**, 503, 98-F7 (1987)
 VLA Observations of a Solar Noise Storm. Kenneth R. Lang and Robert F. Willson. **319**, 514, 98-G8 (1987)
 Alfvén Wave Dissipation in the Solar Atmosphere. G. Einaudi and Yung Mok. **319**, 520, 99-A1 (1987)
 Magnetohydrodynamic Modeling of Coronal Bright Points. W. L. Waldron and D. J. Mullan. **319**, 971, 105-E5 (1987)
 A Numerical Study of the Nonlinear Thermal Stability of Solar Loops. J. A. Klimchuk, S. K. Antiochos, and J. T. Mariska. **320**, 409, 112-D13 (1987)
 Resonance Absorption of Magnetohydrodynamic Surface Waves: Viscous Effects. Joseph V. Hollweg. **320**, 875, 119-D2 (1987)
 Heating of Coronal Loops by Phase-mixed Shear Alfvén Waves. Toufik E. Abdelatif. **322**, 494, 143-D1 (1987)
 Energy Buildup in Coronal Magnetic Flux Tubes. R. S. Steinolfson and T. Tajima. **322**, 503, 143-D10 (1987)
 Properties of Solar Coronal Active Regions Deduced from X-Ray Line Spectra. D. L. McKenzie. **322**, 512, 143-E5 (1987)
 Simulations of the Ca XIX Spectral Emission from a Flaring Solar Coronal Loop. I. Thermal Case. E. Antonucci, M. A. Doderio, G. Peres, S. Serio, and R. Rosner. **322**, 522, 143-F1 (1987)
 Simultaneous SMM Flat Crystal Spectrometer and Very Large Array Observations of Solar Active Regions. Kenneth R. Lang, Robert F. Willson, Kermit L. Smith, and Keith T. Strong. **322**, 1035, 151-C4 (1987)
 Solar Active Region Physical Parameters Inferred from a Thermal Cyclotron Line and Soft X-Ray Spectral Lines. Kenneth R. Lang, Robert F. Willson, Kermit L. Smith, and Keith T. Strong. **322**, 1044, 151-D3 (1987)
 A Multip spacecraft Study of the Injection and Transport of Solar Energetic Particles. J. Beeck, G. M. Mason, D. C. Hamilton, G. Wibberenz, H. Kunow, D. Hovestadt, and B. Klecker. **322**, 1052, 151-D14 (1987)
 Cerenkov Damping of Surface Waves. Altair S. Assis and J. Busnardo-Neto. **323**, 399, 157-D10 (1987)
 The Ejection of Helical Field Structures through the Outer Corona. Lewis L. House and Mitchell A. Berger. **323**, 406, 157-E4 (1987)
- Sun: Eclipses**
 Multifrequency Observations of a Solar Active Region during a Partial Eclipse. Dale E. Gary and G. J. Hurford. **317**, 522, 69-E12 (1987)
- Sun: Faculae**
 Is Solar Neutrino Capture Rate Correlated with Sunspot Number? J. N. Bahcall, G. B. Field, and W. H. Press. **320**, L69, 114-F1 (1987)
- Sun: Flares**
 High Spectral Resolution Measurements of a Solar Flare Hard X-Ray Burst. R. P. Lin and R. A. Schwartz. **312**, 462, 6-A1 (1987)
 Hydrodynamic Flare Modeling: Comparison of Numerical Calculations with SMM Observations of the 1980 November 12 17:00 UT Flare. G. Peres, F. Reale, S. Serio, and R. Pallavicini. **312**, 895, 12-F5 (1987)
 Nonstochastic Prompt Proton Acceleration by Fast Magnetosonic Shocks in the Solar Plasma. Yukiharu Ohsawa and Jun-ichi Sakai. **313**, 440, 19-G4 (1987)
 Turbulence as a Contributor to Intermediate Energy Storage during Solar Flares. P. L. Bornmann. **313**, 449, 19-G13 (1987)
 The Temperature of Solar Flares Determined from X-Ray Spectral Line Ratios. G. A. Doschek and U. Feldman. **313**, 883, 26-D7 (1987)
 Evidence in Meteorites for an Active Early Sun. M. W. Caffee, C. M. Hohenberg, T. D. Swindle, and J. N. Goswami. **313**, L31, 21-C3 (1987)
 Nonpotential Features Observed in the Magnetic Field of an Active Region. G. A. Gary, R. L. Moore, M. J. Hagyard, and Bernhard M. Haisch. **314**, 782, 38-B8 (1987)
 Distribution of Flares on the Sun: Superactive Regions and Active Zones of 1980–1985. Taiel Bai. **314**, 795, 38-C9 (1987)
 Electron Cyclotron Harmonic Wave Acceleration. H. Karimabadi, C. R. Menyuk, P. Sprangle, and L. Vlahos. **316**, 462, 55-B2 (1987)
 Positrons from Accelerated Particle Interactions. B. Kozlovsky, R. E. Lingenfelter, and R. Ramaty. **316**, 801, 60-G6 (1987)
 Laboratory Study of the Spectrum of Highly Ionized Calcium in the 100–250 Å Range Applied to Solar Flare Diagnostics. S. Lippmann, M. Finkenthal, L. K. Huang, H. W. Moos, B. C. Stratton, T. L. Yu, A. K. Bhatia, and W. L. Hodge. **316**, 819, 61-A11 (1987)
 On the Origin of the Pion-Decay Radiation in the 1982 June 3 Solar Flare. R. Ramaty, R. J. Murphy, and C. D. Dermer. **316**, L41, 56-D3 (1987)
 Explosive Evaporation in Solar Flares. George H. Fisher. **317**, 502, 69-D6 (1987)
 The Structure and Dissipation of Forced Current Sheets in the Solar Atmosphere. Tzihong Chiueh and Ellen G. Zweibel. **317**, 900, 76-A7 (1987)
 The Mean Ionic Charge of Silicon in ³He-rich Solar Flares. A. Luhn, B. Klecker, D. Hovestadt, and E. Möbius. **317**, 951, 76-E2 (1987)
 Evidence for Gentle Chromospheric Evaporation during the Gradual Phase of Large Solar Flares. B. Schmieder, T. G. Forbes, J. M. Malherbe, and M. E. Machado. **317**, 956, 76-E8 (1987)
 Analysis of Ultraviolet and X-Ray Observations of Three Homologous Solar Flares from SMM. Chung-Chieh Cheng and Roberto Pallavicini. **318**, 459, 84-A3 (1987)
 Solar Neutron Emission During the Large Flare on 1982 June 3. E. L. Chupp, H. Debrunner, E. Flückiger, D. J. Forrest, F. Golliet, G. Kanbach, W. T. Vestrand, J. Cooper, and G. Share. **318**, 913, 91-A1 (1987)
 Periodicities of the Flare Occurrence Rate in Solar Cycle 19. T. Bai. **318**, L85, 92-E6 (1987)
 Observation of Nonthermal Energy Distributions during the Impulsive Phase of Solar Flares. J. F. Seely, U. Feldman, and G. A. Doschek. **319**, 541, 99-B9 (1987)
 A Determination of the ³He/H Ratio in the Solar Photosphere from Flare Gamma-Ray Line Observations. X.-M. Hua and R. E. Lingenfelter. **319**, 555, 99-C14 (1987)
 Simultaneous VLA Observations of a Flare at 6 and 20 Centimeter Wavelengths. T. Velusamy, M. R. Kundu, E. J. Schmahl, and M. McCabe. **319**, 984, 105-F4 (1987)
 Nonlocal Thermal Transport in Solar Flares. Judith T. Karpen and C. Richard DeVore. **320**, 904, 119-F3 (1987)
 SKYLAB XUV Observations of Densities, Thermal Structure, and Mass Motions in a Compact Flare. Kenneth G. Widing and J. W. Cook. **320**, 913, 119-F14 (1987)
 The H α Spectral Counterparts of Solar Hard X-Rays Microflares. Richard C. Canfield and Thomas R. Metcalf. **321**, 586, 128-E2 (1987)
 Simultaneous 2 and 6 Centimeter Wavelength Observations of a Solar Flare Using the VLA. M. R. Kundu, T. Velusamy, and S. M. White. **321**, 593, 128-E9 (1987)
 Current Loop Coalescence Model of Solar Flares. T. Tajima, J. Sakai, H. Nakajima, T. Kosugi, F. Brunel, and M. R. Kundu. **321**, 1031, 135-F11 (1987)
 Energy Buildup in Coronal Magnetic Flux Tubes. R. S. Steinolfson and T. Tajima. **322**, 503, 143-D10 (1987)
 Impulsive H α Diagnostics of Electron-Beam-Heated Solar Flare Model Chromospheres. Richard C. Canfield and Kenneth G. Gayley. **322**, 999, 150-G10 (1987)
 The Directivity of High-Energy Emission from Solar Flares. II. Solar Maximum Mission Observations. W. Thomas Vestrand, D. J. Forrest, E. L. Chupp, E. Rieger, and G. H. Share. **322**, 1010, 151-A7 (1987)
 X-Ray Observations of Solar Flares with the Einstein Observatory. J. H. M. M. Schmitt, F. R. Harnden, Jr., and H. Fink. **322**, 1023, 151-B6 (1987)
 A Multip spacecraft Study of the Injection and Transport of Solar Energetic Particles. J. Beeck, G. M. Mason, D. C. Hamilton, G. Wibberenz, H. Kunow, D. Hovestadt, and B. Klecker. **322**, 1052, 151-D14 (1987)
 Microflares in the Solar Magnetic Network. J. G. Porter, R. L. Moore, E. J. Reichmann, E. Engvold, and K. L. Harvey. **323**, 380, 157-C5 (1987)
 Proton-Electron Bremsstrahlung Polarization: Solar Flare X-Ray and Gamma-Ray Polarization. D. Heristchi. **323**, 391, 157-D2 (1987)
 Solar Flare Neutron and Accelerated Ion Angular Distributions. X.-M. Hua and R. E. Lingenfelter. **323**, 779, 163-C8 (1987)
 On the Relationship of Flare Size and Particle Anisotropy in Solar Gamma-Ray Flares. Charles D. Dermer. **323**, 795, 163-D10 (1987)
 Transient Ionization and Solar Flare X-Ray Spectra. G. A. Doschek and K. Tanaka. **323**, 799, 163-E1 (1987)
 High-Energy Processes in Solar Flares. R. J. Murphy, C. D. Dermer, and R. Ramaty. **63**, 721, 11-D13 (1987) (Abstr. in **313**, 931, 26-G14)
- Sun: General**
 Evidence in Meteorites for an Active Early Sun. M. W. Caffee, C. M. Hohenberg, T. D. Swindle, and J. N. Goswami. **313**, L31, 21-C3 (1987)
 Is the Solar Oblateness Viable? Measurements of 1985. R. H. Dicke, J. R. Kuhn, and K. G. Libbrecht. **318**, 451, 83-G9 (1987)
- Sun: Granulation**
 Observation and Oscillatory Properties of Mesostructures in the Solar Chromosphere. L. Damé and M. Martic. **314**, L15, 33-C2 (1987)
 On the Relation between Magnetic Field Structures and Granulation. A. M. Title, T. D. Tarbell, and K. P. Topka. **317**, 892, 75-G3 (1987)
- Sun: Interior**
 Hypercharge, Solar Structure, and Stellar Evolution. Ronald L. Gilliland and Werner Däppen. **313**, 429, 19-F7 (1987)
 The Influence of the Coriolis Force on Flux Tubes Rising through the Solar Convection Zone. Arnab Rai Choudhuri and Peter A. Gilman. **316**, 788, 60-F7 (1987)

- Collective Effects on Thomson Scattering in the Solar Interior. *David B. Boercker*. **316**, L95, 62-D12 (1987)
- Solar Oscillations: A Method for Deriving Nonlinear Effects. *Donat G. Wentzel*. **317**, 477, 69-B10 (1987)
- Inertial Oscillations in the Solar Convection Zone. III. A Cylindrical Model for Nonaxisymmetric Oscillations in a Superadiabatic Gradient. *Peter A. Gilman*. **318**, 904, 90-G6 (1987)
- Radiative Alpha-Capture Rates Leading to $A = 7$ Nuclei: Applications to the Solar Neutrino Problem and Big Bang Nucleosynthesis. *Toshitaka Kajino, Hiroshi Toki, and Sam M. Austin*. **319**, 531, 99-A12 (1987)
- A Comparison between Mass-losing and Standard Solar Models. *Joyce A. Guzik, L. A. Willson, and Wendee M. Brunish*. **319**, 957, 105-D5 (1987)
- Solar Oscillations: Generation of a g -Mode by Two p -Modes. *Donat G. Wentzel*. **319**, 966, 105-D14 (1987)
- Weakly Interacting Massive Particle Distribution in and Evaporation from the Sun. *Andrew Gould*. **321**, 560, 128-C3 (1987)
- The Dynamical Oscillation and Propulsion of Magnetic Fields in the Convective Zone of a Star. III. Accumulation of Heat and the Onset of the Rayleigh-Taylor Instability. *E. N. Parker*. **321**, 1009, 135-E3 (1987)
- Sun: Limb Darkening**
- Observations of a Solar Latitude-dependent Limb Brightness Variation: Erratum. *J. R. Kuhn, K. G. Libbrecht, and R. H. Dicke*. **319**, 1010, 106-A8 (1987) (Orig. paper in **290**, 758, 32-C8)
- Sun: Magnetic Fields**
- Propagation of Compressive Waves through Fibril Magnetic Fields. *T. J. Bogdan and Ellen G. Zweibel*. **312**, 444, 5-F10 (1987)
- Flux Tube Models of Solar Plages. *Stephen R. Walton*. **312**, 909, 12-G7 (1987)
- Magnetic Field Measurements on the Sun and Implications for Stellar Magnetic Field Observations. *Wei Hsin Sun, Mark S. Giampapa, and Simon P. Worden*. **312**, 930, 13-B1 (1987)
- The Cooling Time Scales of Growing Sunspots. *Dean-Yi Chou*. **312**, 955, 13-D5 (1987)
- Nonpotential Features Observed in the Magnetic Field of an Active Region. *G. A. Gary, R. L. Moore, M. J. Hagyard, and Bernhard M. Haisch*. **314**, 782, 38-B8 (1987)
- The Plasma and Magnetic Field Properties of Coronal Loops Observed at High Spatial Resolution. *D. F. Webb, G. D. Holman, J. M. Davis, M. R. Kundu, and R. K. Shevgaonkar*. **315**, 716, 48-D11 (1987)
- The Influence of the Coriolis Force on Flux Tubes Rising through the Solar Convection Zone. *Arnab Rai Choudhuri and Peter A. Gilman*. **316**, 788, 60-F7 (1987)
- On the Relation between Magnetic Field Structures and Granulation. *A. M. Title, T. D. Tarbell, and K. P. Topka*. **317**, 892, 75-G3 (1987)
- Rotation of the Coronal Magnetic Fields. *J. T. Hoeksema and P. H. Scherrer*. **318**, 428, 83-E12 (1987)
- The Magnetic and Velocity Structure Adjacent to Solar Active Regions. *R. Grant Athay and J. A. Klimchuk*. **318**, 437, 83-F7 (1987)
- Propagation of Compressive Waves through Fibril Magnetic Fields. II. Scattering from a Slab of Magnetic Flux Tubes. *T. J. Bogdan*. **318**, 888, 90-F4 (1987)
- Propagation of Compressive Waves through Fibril Magnetic Fields. III. Waves that Propagate along the Magnetic Field. *T. J. Bogdan*. **318**, 896, 90-F12 (1987)
- Stokes Profile Analysis and Vector Magnetic Fields. III. Extended Temperature Minima of Sunspot Umbrae as inferred from Stokes Profiles of Mg I $\lambda 4471$. *B. W. Lites, A. Skumanich, D. E. Rees, G. A. Murphy, and M. Carlsson*. **318**, 930, 91-B6 (1987)
- The Origin of Rigidly Rotating Magnetic Field Patterns on the Sun. *N. R. Sheeley, Jr., A. G. Nash, and Y.-M. Wang*. **319**, 481, 98-D5 (1987)
- Radio Evidence for a Magnetic Mirror Effect on Beams of Subrelativistic Electrons in the Solar Corona. *C. Caroubalos, M. Poquérusse, J.-L. Bourgeret, and R. Crépel*. **319**, 503, 98-F7 (1987)
- Energy Buildup in Coronal Magnetic Flux Tubes. *R. S. Steinolfson and T. Tajima*. **322**, 503, 143-D10 (1987)
- Solar Active Region Physical Parameters Inferred from a Thermal Cyclotron Line and Soft X-Ray Spectral Lines. *Kenneth R. Lang, Robert F. Willson, Kermit L. Smith, and Keith T. Strong*. **322**, 1044, 151-D3 (1987)
- Electric Current Sheet Formation in a Magnetic Field Induced by Continuous Magnetic Footpoint Displacements. *B. C. Low*. **323**, 358, 157-A1 (1987)
- On the Large-Scale Dynamics and Magnetic Structure of Solar Active Regions. *James A. Klimchuk*. **323**, 368, 157-B1 (1987)
- Microflares in the Solar Magnetic Network. *J. G. Porter, R. L. Moore, E. J. Reichmann, E. Engold, and K. L. Harvey*. **323**, 380, 157-C5 (1987)
- Sun: Oscillations**
- Propagation of Compressive Waves through Fibril Magnetic Fields. *T. J. Bogdan and Ellen G. Zweibel*. **312**, 444, 5-F10 (1987)
- Simultaneous Measurements of Sunspot Umbral Oscillations in the Photosphere, Chromosphere, and Transition Region. *John H. Thomas, Bruce W. Lites, Joseph B. Gurman, and Edwin F. Ladd*. **312**, 457, 5-G9 (1987)
- Observation and Oscillatory Properties of Mesostructures in the Solar Chromosphere. *L. Damé and M. Martić*. **314**, L15, 33-C2 (1987)
- Depth and Latitude Dependence of Solar Rotation. *Timothy M. Brown and Cherynn A. Morrow*. **314**, L21, 33-C8 (1987)
- Spectroscopic Evidence for a Moving Pattern of Azimuthal Rolls on the Sun. *Herschel B. Snodgrass*. **316**, L91, 62-D8 (1987)
- Solar Oscillations: A Method for Deriving Nonlinear Effects. *Donat G. Wentzel*. **317**, 477, 69-B10 (1987)
- Propagation of Compressive Waves through Fibril Magnetic Fields. II. Scattering from a Slab of Magnetic Flux Tubes. *T. J. Bogdan*. **318**, 888, 90-F4 (1987)
- Propagation of Compressive Waves through Fibril Magnetic Fields. III. Waves that Propagate along the Magnetic Field. *T. J. Bogdan*. **318**, 896, 90-F12 (1987)
- Inertial Oscillations in the Solar Convection Zone. III. A Cylindrical Model for Nonaxisymmetric Oscillations in a Superadiabatic Gradient. *Peter A. Gilman*. **318**, 904, 90-G6 (1987)
- Solar Oscillations: Generation of a g -Mode by Two p -Modes. *Donat G. Wentzel*. **319**, 966, 105-D14 (1987)
- Acoustic Absorption by Sunspots. *D. C. Braun, T. L. Dwall, Jr., and B. J. LaBonte*. **319**, L27, 100-C9 (1987)
- The Interaction of Solar p -Modes with a Sunspot. II. Simple Theoretical Models. *Toufik E. Abdelatif and John H. Thomas*. **320**, 884, 119-D11 (1987)
- Asymptotic Approximations for Higher Order Nonradial Oscillations of a Spherically Symmetric Star. *P. Smeyers and M. Tassoul*. **65**, 429, 34-B11 (1987) (Abstr. in **321**, 1051, 136-A2)
- Sun: Plages**
- Flux Tube Models of Solar Plages. *Stephen R. Walton*. **312**, 909, 12-G7 (1987)
- Objective Characterization of Stellar Activity Cycles. I. Methods and Solar Cycle Analyses. *Ronald L. Gilliland and Sallie L. Balunas*. **314**, 766, 38-A6 (1987)
- Sun: Prominences**
- Static Current-Sheet Models of Quiescent Prominences. *F. Wu and B. C. Low*. **312**, 431, 5-E3 (1987)
- O $\lambda 7774$ Diagnostic for Quiescent Prominences. *Nancy S. Brickhouse and Donald A. Landman*. **313**, 463, 20-A13 (1987)
- Nonlinear Radiative Condensation in a Sheared Magnetic Field. *G. Van Hoven, L. Sparks, and D. D. Schnack*. **317**, L91, 78-D9 (1987)
- Stability of Current-Sheet Models of Quiescent Prominences and Equatorial Disks. *F. Wu*. **320**, 418, 112-E8 (1987)
- The Ejection of Helical Field Structures through the Outer Corona. *Lewis L. House and Mitchell A. Berger*. **323**, 406, 157-E4 (1987)
- Sun: Radio Radiation**
- The Plasma and Magnetic Field Properties of Coronal Loops Observed at High Spatial Resolution. *D. F. Webb, G. D. Holman, J. M. Davis, M. R. Kundu, and R. K. Shevgaonkar*. **315**, 716, 48-D11 (1987)
- Electron Cyclotron Harmonic Wave Acceleration. *H. Karimabadi, C. R. Menyuk, P. Sprangle, and L. Vlahos*. **316**, 462, 55-B2 (1987)
- Multifrequency Observations of a Solar Active Region during a Partial Eclipse. *Dale E. Gary and G. J. Hurford*. **317**, 522, 69-E12 (1987)
- Solar Brightness Temperature at Submillimeter Wavelengths. *R. T. Boreiko and T. A. Clark*. **318**, 445, 83-G2 (1987)
- Radio Evidence for a Magnetic Mirror Effect on Beams of Subrelativistic Electrons in the Solar Corona. *C. Caroubalos, M. Poquérusse, J.-L. Bourgeret, and R. Crépel*. **319**, 503, 98-F7 (1987)
- VLA Observations of a Solar Noise Storm. *Kenneth R. Lang and Robert F. Willson*. **319**, 514, 98-G8 (1987)
- Simultaneous VLA Observations of a Flare at 6 and 20 Centimeter Wavelengths. *T. Velusamy, M. R. Kundu, E. J. Schmahl, and M. McCabe*. **319**, 984, 105-F4 (1987)
- Simultaneous 2 and 6 Centimeter Wavelength Observations of a Solar Flare Using the VLA. *M. R. Kundu, T. Velusamy, and S. M. White*. **321**, 593, 128-E9 (1987)
- Evolution of the Axial Electron Cyclotron Maser Instability, with Applications to Solar Microwave Spikes. *Loukas Vlahos and Phillip Sprangle*. **322**, 463, 143-A10 (1987)
- Simultaneous SMM Flat Crystal Spectrometer and Very Large Array Observations of Solar Active Regions. *Kenneth R. Lang, Robert F. Willson, Kermit L. Smith, and Keith T. Strong*. **322**, 1035, 151-C4 (1987)
- Solar Active Region Physical Parameters Inferred from a Thermal Cyclotron Line and Soft X-Ray Spectral Lines. *Kenneth R. Lang*.

Sun: Radio Radiation—Continued

- Robert F. Willson, Kermit L. Smith, and Keith T. Strong. **322**, 1044, 151-D3 (1987)

Sun: Rotation

- Distribution of Flares on the Sun: Superactive Regions and Active Zones of 1980–1985. *Taeil Bai*. **314**, 795, 38-C9 (1987)
 Depth and Latitude Dependence of Solar Rotation. *Timothy M. Brown and Cheryll A. Morrow*. **314**, L21, 33-C8 (1987)
 Rotation of the Coronal Magnetic Fields. *J. T. Hoeksema and P. H. Scherrer*. **318**, 428, 83-E12 (1987)
 Inertial Oscillations in the Solar Convection Zone. III. A Cylindrical Model for Nonaxisymmetric Oscillations in a Superadiabatic Gradient. *Peter A. Gilman*. **318**, 904, 90-G6 (1987)
 Probing Gravity to the Second Post-Newtonian Order and to One Part in 10^7 Using the Spin Axis of the Sun. *Ken Nordtvedt*. **320**, 871, 119-C12 (1987)

Sun: Solar Wind

- Theoretical Non-Maxwellian Particle Velocity Distribution Functions for Spherically Symmetric Solar Wind-like Plasma Systems and Consequences. II. The Case of Large Thermal Anisotropy and Nine Moments Description for Each Species. *S. Cuperman, H. Yatani, M. Dryer, and D. Lewis*. **314**, 404, 32-E11 (1987)
 Magnetic Helicity of the Parker Field. *J. W. Bieber, P. A. Evenson, and W. H. Matthaeus*. **315**, 700, 48-C7 (1987)
 Solar Wind Diagnostics from Doppler-enhanced Scattering. *Giancarlo Noci, John L. Kohl, and George L. Withbroe*. **315**, 706, 48-D1 (1987)
 Solar Cycle Study of Interplanetary Lyman-Alpha Variations: PIONEER VENUS Orbiter Sky Background Results. *J. M. Ajello, A. I. Stewart, G. E. Thomas, and A. Graps*. **317**, 964, 76-F5 (1987)
 Planetary Fast Neutral Emission and Effects on the Solar Wind: A Cometary Exosphere Analog: Erratum. *D. D. Barbosa and A. Evitar*. **321**, 1049, 136-A1 (1987) (Orig. paper in **310**, 927, 144-B10)
 Radio Range Measurements of Coronal Electron Densities at 13 and 3.6 Centimeter Wavelengths during the 1985 Solar Conjunction of Voyager 2. *John D. Anderson, Timothy P. Krisher, Susan E. Borutzki, Michael J. Connolly, Paula M. Eshe, Henry B. Hotz, Scott Kinslow, Emil R. Kursinski, Luann Brown Light, Steven E. Matousek, Katherine I. Moyd, Duane C. Roth, Donald N. Sweetnam, Anthony H. Taylor, G. Leonard Tyler, Donna L. Gresh, and Paul A. Rosen*. **323**, L141, 164-E1 (1987)

Sun: Spectra

- SMM Observations of Si IV and O IV Bursts in Solar Active Regions. *Marion Hayes and R. A. Shine*. **312**, 943, 13-C6 (1987)
 Chromospheric Ca II K-Line Variations in the Sun as a Star over a Solar Cycle. *K. R. Sivaraman, Jagdev Singh, S. P. Bagare, and S. S. Gupta*. **313**, 456, 20-A6 (1987)
 O $\lambda 7774$ Diagnostic for Quiescent Prominences. *Nancy S. Brickhouse and Donald A. Landman*. **313**, 463, 20-A13 (1987)
 The Temperature of Solar Flares Determined from X-Ray Spectral Line Ratios. *G. A. Doschek and U. Feldman*. **313**, 883, 26-D7 (1987)
 Solar Luminosity Variation. V. The Photospheric Lines 1976–1985. *W. Livingston and L. Wallace*. **314**, 808, 38-D8 (1987)
 Solar Wind Diagnostics from Doppler-enhanced Scattering. *Giancarlo Noci, John L. Kohl, and George L. Withbroe*. **315**, 706, 48-D1 (1987)
 On the Apparent Velocity of Integrated Sunlight. I. 1983–1985. *Drake Deming, Fred Espenak, Donald E. Jennings, James W. Brault, and Jeremy Wagner*. **316**, 771, 60-E4 (1987)
 Ne IX Emission-Line Ratios in Solar Active Regions. *F. P. Keenan, D. L. McKenzie, S. M. McCann, and A. E. Kingston*. **318**, 926, 91-B2 (1987)
 The Solar Boron Abundance. *R. C. M. Learner and C. J. Harris*. **320**, 926, 120-A3 (1987)
 Simulations of the Ca XIX Spectral Emission from a Flaring Solar Coronal Loop. I. Thermal Case. *E. Antonucci, M. A. Doderio, G. Peres, S. Serio, and R. Rosner*. **322**, 522, 143-F1 (1987)
 Transient Ionization and Solar Flare X-Ray Spectra. *G. A. Doschek and K. Tanaka*. **323**, 799, 163-E1 (1987)

Sun: Sunspots

- Propagation of Compressive Waves through Fibril Magnetic Fields. *T. J. Bogdan and Ellen G. Zweibel*. **312**, 444, 5-F10 (1987)
 Simultaneous Measurements of Sunspot Umbra Oscillations in the Photosphere, Chromosphere, and Transition Region. *John H. Thomas, Bruce W. Lites, Joseph B. Gurman, and Edwin F. Ladd*. **312**, 457, 5-G9 (1987)
 Magnetic Field Measurements on the Sun and Implications for Stellar Magnetic Field Observations. *Wei-Hsin Sun, Mark S. Giampapa, and Simon P. Worden*. **312**, 930, 13-B1 (1987)
 The Cooling Time Scales of Growing Sunspots. *Dean-Yi Chou*. **312**, 955, 13-D5 (1987)
 Propagation of Compressive Waves through Fibril Magnetic Fields. II. Scattering from a Slab of Magnetic Flux Tubes. *T. J. Bogdan*. **318**,

- 888, 90-F4 (1987)
 Propagation of Compressive Waves through Fibril Magnetic Fields. III. Waves that Propagate along the Magnetic Field. *T. J. Bogdan*. **318**, 896, 90-F12 (1987)
 Stokes Profile Analysis and Vector Magnetic Fields. III. Extended Temperature Minima of Sunspot Umbrae as Inferred from Stokes Profiles of Mg I $\lambda 4571$. *B. W. Lites, A. Skumanich, D. E. Rees, G. A. Murphy, and M. Carlsson*. **318**, 930, 91-B6 (1987)
 Acoustic Absorption by Sunspots. *D. C. Braun, T. L. Duwall, Jr., and B. J. LaBonte*. **319**, L27, 100-C9 (1987)
 The Interaction of Solar p -Modes with a Sunspot. II. Simple Theoretical Models. *Toufik E. Abdelatif and John H. Thomas*. **320**, 884, 119-D11 (1987)
 Stokes Profile Analysis and Vector Magnetic Fields. I. Inversion of Photospheric Lines. *A. Skumanich and B. W. Lites*. **322**, 473, 143-B8 (1987)
 The Polarization Properties of Model Sunspots: The Broad-Band Polarization Signature of the Schlüter-Temesvary Representation. *A. Skumanich and B. W. Lites*. **322**, 483, 143-C4 (1987)
- Sun: Transition Region**
 Ultraviolet Al III Emission Lines and the Physics of the Solar Transition Region. *G. A. Doschek and U. Feldman*. **315**, L67, 45-F5 (1987)
 On the Unresolved Fine Structures of the Solar Atmosphere. II. The Temperature Region 2×10^5 K– 5×10^5 K. *U. Feldman*. **320**, 426, 112-F2 (1987)
- Sun: X-Rays**
 High Spectral Resolution Measurements of a Solar Flare Hard X-Ray Burst. *R. P. Lin and R. A. Schwartz*. **312**, 462, 6-A1 (1987)
 The Temperature of Solar Flares Determined from X-Ray Spectral Line Ratios. *G. A. Doschek and U. Feldman*. **313**, 883, 26-D7 (1987)
 Distribution of Flares on the Sun: Superactive Regions and Active Zones of 1980–1985. *Taeil Bai*. **314**, 795, 38-C9 (1987)
 The Plasma and Magnetic Field Properties of Coronal Loops Observed at High Spatial Resolution. *D. F. Webb, G. D. Holman, J. M. Davis, M. R. Kundu, and R. K. Shevgaonkar*. **315**, 716, 48-D11 (1987)
 Analysis of Ultraviolet and X-Ray Observations of Three Homologous Solar Flares from SMM. *Chung-Chieh Cheng and Roberto Pallavicini*. **318**, 459, 84-A3 (1987)
 Observation of Nonthermal Energy Distributions during the Impulsive Phase of Solar Flares. *J. F. Seely, U. Feldman, and G. A. Doschek*. **319**, 541, 99-B9 (1987)
 Short Solar Events with Evidence of Repetitive Structures. *Upendra D. Desai, Chryssa Koweliotou, C. Barat, K. Hurley, M. Niel, R. Talon, G. Vedrenne, I. V. Estulin, and V. Ch. Dolidze*. **319**, 567, 99-E1 (1987)
 Magnetohydrodynamic Modeling of Coronal Bright Points. *W. L. Waldron and D. J. Mullan*. **319**, 971, 105-E5 (1987)
 SKYLAB XUV Observations of Densities, Thermal Structure, and Mass Motions in a Compact Flare. *Kenneth G. Widing and J. W. Cook*. **320**, 913, 119-F14 (1987)
 The H α Spectral Counterparts of Solar Hard X-Ray Microflares. *Richard C. Canfield and Thomas R. Metcalf*. **321**, 586, 128-E2 (1987)
 Properties of Solar Coronal Active Regions Deduced from X-Ray Line Spectra. *D. L. McKenzie*. **322**, 512, 143-E5 (1987)
 Simulations of the Ca XIX Spectral Emission from a Flaring Solar Coronal Loop. I. Thermal Case. *E. Antonucci, M. A. Doderio, G. Peres, S. Serio, and R. Rosner*. **322**, 522, 143-F1 (1987)
 The Directivity of High-Energy Emission from Solar Flares. II. Solar Maximum Mission Observations. *W. Thomas Vestrand, D. J. Forrest, E. L. Chupp, E. Rieger, and G. H. Share*. **322**, 1010, 151-A7 (1987)
 X-Ray Observations of Solar Flares with the Einstein Observatory. *J. H. M. M. Schmitt, F. R. Harnden, Jr., and H. Fink*. **322**, 1023, 151-B6 (1987)
 Simultaneous SMM Flat Crystal Spectrometer and Very Large Array Observations of Solar Active Regions. *Kenneth R. Lang, Robert F. Willson, Kermit L. Smith, and Keith T. Strong*. **322**, 1035, 151-C4 (1987)
 Solar Active Region Physical Parameters Inferred from a Thermal Cyclotron Line and Soft X-Ray Spectral Lines. *Kenneth R. Lang, Robert F. Willson, Kermit L. Smith, and Keith T. Strong*. **322**, 1044, 151-D3 (1987)
 Proton-Electron Bremsstrahlung Polarization: Solar Flare X-Ray and Gamma-Ray Polarization. *D. Heristchi*. **323**, 391, 157-D2 (1987)
 Transient Ionization and Solar Flare X-Ray Spectra. *G. A. Doschek and K. Tanaka*. **323**, 799, 163-E1 (1987)
- Transition Probabilities**
 Ultraviolet Doubly Excited Fe II Lines in the Laboratory and in the A-Type Star 21 Pegasi. *J. Adam, B. Baschek, S. Johansson, A. E. Nilsson, and T. Brage*. **312**, 337, 4-E6 (1987)
 Effective Collision Strengths for Electron Impact Excitation in S II. S.

- S. Tayal, J. W. Henry, and S. Nakazaki.* **313**, 487, 20-C10 (1987)
- Electron Impact Excitation of H_2 : Rydberg Band Systems and the Benchmark Dissociative Cross Section of H Lyman-Alpha. *D. E. Shemansky, J. M. Ajello, and D. T. Hall.* **315**, 408, 44-C14 (1987) (Orig. paper in **296**, 765, 98-D6)
- Fluorescence Efficiency Factors for Ionized Water Vapor. *Barry L. Lutz.* **315**, L147, 49-G2 (1987)
- Resonant Raman-Cyclotron Scattering in Very Strong Magnetic Fields. *Edouard Miska and Dominique Miska.* **317**, 282, 67-A7 (1987)
- Absolute Oscillator Strengths for 108 Lines of Si I between 163 and 410 Nanometers. *Peter L. Smith, M. C. E. Huber, G. P. Tozzi, H. E. Griesinger, B. L. Cardon, and G. G. Lombardi.* **322**, 573, 144-B12 (1987)
- Vibration-Rotational Intensities for the $X^1\Sigma^+$ State of Al H and Al D. *R. H. Tipping, A. Lopez Piñero, and C. Chackerian, Jr.* **323**, 810, 163-E12 (1987)
- Collision Rates for Excitation of Helium-like Ions with Inclusion of Resonance Effects. *Honglin Zhang and Douglas H. Sampson.* **63**, 487, 8-D5 (1987) (Abstr. in **312**, 967, 13-E8)
- Turbulence**
- Small-Scale Structure of the Taurus Molecular Clouds: Turbulence in Heiles' Cloud 2. *S. C. Kleiner and R. L. Dickman.* **312**, 837, 12-B2 (1987)
- Turbulence as a Contributor to Intermediate Energy Storage during Solar Flares. *P. L. Bornmann.* **313**, 449, 19-G13 (1987)
- A New Estimate of the Mixing Length and Convective Overshooting in Massive Stars. *Lawrence D. Cloutman.* **313**, 699, 24-D8 (1987)
- Jet Collimation by Turbulent Viscosity. *I. R. N. Henriksen.* **314**, 33, 28-D1 (1987)
- Angular Momentum in a Turbulent Interstellar Medium. *Robert C. Fleck, Jr.* **315**, 259, 42-F14 (1987)
- On the Generation of Magnetohydrodynamic Waves in a Stratified and Magnetized Fluid. I. Vertical Propagation. *Z. E. Musielak and R. Rosner.* **315**, 371, 44-A5 (1987)
- Refractive Scintillation in the Interstellar Medium. *W. A. Coles, R. G. Frehlich, B. J. Rickett, and J. L. Codona.* **315**, 666, 48-A1 (1987)
- Fine-Scale Motion in the Central Orion Nebula. *Héctor O. Castañeda and C. R. O'Dell.* **315**, L55, 45-E9 (1987)
- Fine-Scale Motion in NGC 6514 and NGC 6523. *C. R. O'Dell, L. K. Townsley, and Hector O. Castañeda.* **317**, 676, 73-D10 (1987)
- Evidence for Turbulence in H II Regions. *C. R. O'Dell and Hector O. Castañeda.* **317**, 686, 73-E6 (1987)
- An Analysis of the Photospheric Line Profiles in F, G, and K Super-giants. *David F. Gray and C. G. Toner.* **322**, 360, 141-G1 (1987)
- VLA and Low-Frequency VLBI Observations of the Radio Source 0503 + 467: Austere Constraints on Interstellar Scattering in Two Media. *Steven R. Spangler, Alan L. Fey, and James M. Cordes.* **322**, 909, 149-G3 (1987)
- Velocity Waves in 21 Centimeter Self-Absorption toward the Taurus Molecular Complex. *W. L. H. Shuter, R. L. Dickman, and C. Klatt.* **322**, L103, 152-D8 (1987)
- Ultraviolet: General**
- Pioneer 10 Observations of the Beta Cephei Stars Gamma Pegasi and Delta Ceti. *Geraldine J. Peters, H. S. Ogawa, K. S. Judge, and D. L. Judge.* **314**, 261, 31-A3 (1987)
- Vacuum Ultraviolet Images of the Large Magellanic Cloud. *Andrew M. Smith, Robert M. Cornett, and Robert S. Hill.* **320**, 609, 116-C9 (1987)
- Ultraviolet: Spectra**
- Ultraviolet Doubly Excited Fe II Lines in the Laboratory and in the A-Type Star 21 Pegasi. *J. Adam, B. Baschek, S. Johansson, A. E. Nilsson, and T. Brage.* **312**, 337, 4-E6 (1987)
- SMM Observations of Si IV and O IV Bursts in Solar Active Regions. *Marion Hayes and R. A. Shine.* **312**, 943, 13-C6 (1987)
- The Origin of the Photoionizing Continuum of Active Galactic Nuclei and Quasars. *S. L. O'Dell, H. A. Scott, and W. A. Stein.* **313**, 164, 16-F14 (1987)
- The Effect of the Lyman-Alpha Forest on the Ultraviolet Continua of Very High Redshift Quasars. *Charles C. Steidel and Wallace L. W. Sargent.* **313**, 171, 16-G7 (1987)
- The Problem of V444 Cygni. *A. B. Underhill and R. P. Fahey.* **313**, 358, 18-G9 (1987)
- Comparison of Submillimeter and Ultraviolet Observations of Neutral Carbon toward Zeta Ophiuchi. *Jocelyn Keene, Geoffrey A. Blake, and T. G. Phillips.* **313**, 396, 19-D1 (1987)
- The Exotic Helium Variable PG 1346 + 082. *M. A. Wood, D. E. Winget, R. E. Nather, Frederic V. Hessman, James Liebert, Donald W. Kurtz, F. Wesemael, and G. Wegner.* **313**, 757, 25-B1 (1987)
- The Ultraviolet Spectra of Intermediate-Redshift Quasars. II. *A. L. Kinney, P. J. Huggins, A. E. Glassgold, and J. N. Bregman.* **314**, 145, 29-E7 (1987)
- Ultraviolet Spectra and Chromospheres of Cool Carbon Stars. *Hollis R. Johnson and Donald G. Luttermoser.* **314**, 329, 31-F9 (1987)
- A Physical Model for the 2175 Å Interstellar Extinction Feature: Erratum. *J. H. Hecht.* **314**, 429, 32-G9 (1987) (Orig. paper in **305**, 817, 77-G6)
- The Planetary Nebula NGC 3918. *R. E. S. Clegg, J. P. Harrington, M. J. Barlow, and J. R. Walsh.* **314**, 551, 35-E7 (1987)
- The Integrated Ultraviolet Radiation Field from QSOs. *Jill Bechtold, Ray J. Weymann, Zuo Lin, and Matthew A. Malkan.* **315**, 180, 42-A4 (1987)
- A 217.5 Nanometer Absorption Feature in the Spectrum of Small Silicate Particles. *T. M. Steel and W. W. Duley.* **315**, 337, 43-E8 (1987)
- Electron Impact Excitation of H_2 : Rydberg Band Systems and the Benchmark Dissociative Cross Section of H Lyman-Alpha. *D. E. Shemansky, J. M. Ajello, and D. T. Hall.* **315**, 408, 44-C14 (1987) (Orig. paper in **296**, 765, 98-D6)
- IUE Observations of Hydrogen and Deuterium in the Local Interstellar Medium. *J. Murthy, R. C. Henry, H. W. Moos, W. B. Landsman, J. L. Linsky, A. Vidal-Madjar, and C. Gry.* **315**, 675, 48-A10 (1987)
- Solar Wind Diagnostics from Doppler-enhanced Scattering. *Giancarlo Noci, John L. Kohl, and George L. Withbroe.* **315**, 706, 48-D1 (1987)
- Ultraviolet Al III Emission Lines and the Physics of the Solar Transition Region. *G. A. Doschek and U. Feldman.* **315**, L67, 45-F5 (1987)
- Ultraviolet Spectra of HH 1 and HH 2: Spatial Variations and the Continuum Problem. *K. H. Böhm, Th. Bührke, A. C. Raga, E. W. Bruge, A. N. Witt, and R. Mundt.* **316**, 349, 53-G7 (1987)
- BE Ursae Majoris: A Detached Binary with a Unique Reprocessing Spectrum. *Donald H. Ferguson, James Liebert, Roc Cutri, Richard F. Green, S. P. Willner, João E. Steiner, and Susan Tokarz.* **316**, 399, 54-D4 (1987)
- The Dependence of Ultraviolet Chromospheric Emission upon Rotation among Late-Type Stars. *Theodore Simon and Francis C. Fekel, Jr.* **316**, 434, 54-G2 (1987)
- Interdependence of the 4430 Å Diffuse Interstellar Band, Polarization, and Ultraviolet Extinction. *J. Królowski, G. A. H. Walker, G. R. Grieve, and G. M. Hill.* **316**, 449, 55-A3 (1987)
- Broad, Variable Absorption Lines in the Seyfert Galaxy NGC 3516: Probing the Structure of the Emission-Line Regions. *G. Mark Voit, J. Michael Shull, and Mitchell C. Begelman.* **316**, 573, 58-C5 (1987)
- The Stars with H α Missing. *Ronald A. Downes.* **316**, 763, 60-D8 (1987)
- Laboratory Study of the Spectrum of Highly Ionized Calcium in the 100–250 Å Range Applied to Solar Flare Diagnostics. *S. Lippmann, M. Finkenthal, L. K. Huang, H. W. Moos, B. C. Stratton, T. L. Yu, A. K. Bhatia, and W. L. Hodge.* **316**, 819, 61-A11 (1987)
- The UV Excess of Quasars: Luminosity Dependence. *Amri Wandel.* **316**, L55, 62-B1 (1987)
- Ultraviolet Observations of Extensive Variability in the Stellar Wind of ξ Persei. *Raman K. Prinja, Ian D. Howarth, and Huib F. Henrichs.* **317**, 389, 68-B11 (1987)
- Velocity Fields in a Low-Latitude Coronal Hole: Results from the Solar Maximum Mission. *D. J. Mullan and W. L. Waldron.* **317**, 487, 69-C5 (1987)
- Rapid Variability of P Cygni Lines in Massive X-Ray Binaries. *Timothy R. Kallman, Richard McCray, and G. Mark Voit.* **317**, 746, 74-B12 (1987)
- Solar Cycle Study of Interplanetary Lyman-Alpha Variations: PIONEER VENUS Orbiter Sky Background Results. *J. M. Ajello, A. I. Stewart, G. E. Thomas, and A. Graps.* **317**, 964, 76-F5 (1987)
- Inside Supernova 1987A. *Richard McCray, J. Michael Shull, and Peter Sutherland.* **317**, L73, 78-C7 (1987)
- Periodic Photospheric and Chromospheric Modulation in Alpha Orionis (Betelgeuse). *A. K. Dupree, S. L. Balunas, E. F. Guinan, L. Hartmann, G. E. Nassiopoulou, and G. Sonneborn.* **317**, L86, 78-D4 (1987)
- The Ultraviolet and Optical Emission-Line Spectrum of III Zw 77. *Gary J. Ferland and Donald E. Osterbrock.* **318**, 145, 80-E3 (1987)
- The Magnetic and Velocity Structure Adjacent to Solar Active Regions. *R. Grant Athay and J. A. Klimchuk.* **318**, 437, 83-F7 (1987)
- Analysis of Ultraviolet and X-Ray Observations of Three Homologous Solar Flares from SMM. *Chung-Chieh Cheng and Roberto Pallavicini.* **318**, 459, 84-A3 (1987)
- Optical Properties of Interstellar Graphite and Silicate Grains: Erratum. *B. T. Draine and Hyung Mok Lee.* **318**, 485, 84-C4 (1987) (Orig. paper in **285**, 89, 111-A3)
- Isophotal Diameters of Galaxies at High Redshifts. *Daniel W. Weedman and Karen L. Williams.* **318**, 585, 87-C10 (1987)
- Studies of Hot B Subdwarfs. V. Continuing Investigation of the C, N, and Si Abundance Patterns in the Atmospheres of sdB Stars. *R. Lamontagne, F. Wesemael, and G. Fontaine.* **318**, 844, 90-C1 (1987)

Ultraviolet Spectra—Continued

- An IUE Survey of Activity in Red Giants and Supergiants. I. Oznovich and D. M. Gibson. **319**, 383, 97-C10 (1987)
- Emission-Line Ratios for O III in Gaseous Nebulae and a Comparison between Theory and Observation. F. P. Kennan and K. M. Aggarwal. **319**, 403, 97-E7 (1987)
- The (C III $\lambda 1909$ /Si III $\lambda 1892$) Ratio as a Diagnostic for Planetary Nebulae and Symbiotic Stars. Walter A. Feibelman and Lawrence H. Aller. **319**, 407, 97-E11 (1987)
- Ultraviolet and Visual Spectroscopy of DB White Dwarfs. G. Wegner and E. P. Nelan. **319**, 916, 105-A5 (1987)
- First Unambiguous X-Ray Detection of R Aquarii. R. Viotti, L. Piro, M. Friedjung, and A. Cassatella. **319**, L7, 100-A10 (1987)
- Detection of Neutral Oxygen and Sulfur Emissions near Io Using IUE. G. E. Ballester, H. W. Moos, P. D. Feldman, D. F. Strobel, M. E. Summers, J.-L. Bertaux, T. E. Skinner, M. C. Festou, and J. H. Lieske. **319**, L33, 100-D1 (1987)
- Physical Parameters for 12 Planetary Nebulae and Their Central Stars in the Magellanic Clouds. Lawrence H. Aller, Charles D. Keyes, Stephen P. Maran, Theodore R. Gull, Andrew G. Michalitsianos, and Theodore P. Stecher. **320**, 159, 109-F12 (1987)
- Highly Ionized Stellar Winds in Be Stars: The Evidence for Aspect Dependence. C. A. Grady, K. S. Bjorkman, and T. P. Snow. **320**, 376, 112-B8 (1987)
- The Abundance of Gallium in B-Type Chemically Peculiar Stars: Addendum. Masahide Takada-Hidai, Kozo Sadakane, and Jun Jugaku. **320**, 437, 112-G4 (1987) (Orig. paper in **304**, 425, 58-D14)
- The Interstellar Medium toward Supernova 1987A. A. K. Dupree, R. P. Kirshner, G. E. Nassiopoulos, J. C. Raymond, and G. Sonneborn. **320**, 597, 116-B11 (1987)
- Ultraviolet Observations of SN 1987A. Robert P. Kirshner, George Sonneborn, D. Michael Crenshaw, and George E. Nassiopoulos. **320**, 602, 116-C2 (1987)
- The Local Interstellar Medium. VII. The Local Interstellar Wind and Interstellar Material in Front of the Nearby Star α Ophiuchi. P. C. Frisch, D. G. York, and J. R. Fowler. **320**, 842, 119-A10 (1987)
- SKYLAB XUV Observations of Densities, Thermal Structure, and Mass Motions in a Compact Flare. Kenneth G. Widing and J. W. Cook. **320**, 913, 119-F14 (1987)
- The Fading of the Narrow-Line Region in 3C 390.3. J. Clavel and W. Wamsteker. **320**, L9, 114-A12 (1987)
- A Detailed Study of the C IV $\lambda 1550$ Line Profile and Adjacent Spectral Features in NGC 4151 from 1978 to 1983. J. Clavel, A. Altamore, A. Boksenberg, G. E. Bromage, A. Elvius, D. Pelat, M. V. Penston, G. C. Perola, M. A. J. Snijders, and M. H. Ulrich. **321**, 251, 125-A5 (1987)
- Identification of Lines in the Satellite Ultraviolet: The Spectrum of Tau Scorpii. Charles R. Cowley and Donald R. Merritt. **321**, 553, 128-B10 (1987)
- Spectral Synthesis in the Ultraviolet. I. Far-Ultraviolet Stellar Library. Michael N. Fanelli, Robert W. O'Connell, and Trinh X. Thuan. **321**, 768, 133-A1 (1987)
- The Unusual Dust-scattering Properties in the Reflection Nebula CED 201. A. N. Witt, R. C. Bohlin, T. P. Stecher, and S. M. Graff. **321**, 912, 134-E4 (1987)
- Further Observations of the Peculiar Hot Helium-rich Degenerate KPD 0005 + 5106. Ronald A. Downes, Edward M. Sion, James Liebert, and J. B. Holberg. **321**, 943, 134-G7 (1987)
- High-Resolution Ultraviolet Observations of Interstellar Lines toward ξ Persei Observed with the Balloon-borne Ultraviolet Spectrometer. Theodore P. Snow, H. J. G. L. M. Lamers, and Charles L. Joseph. **321**, 952, 135-A2 (1987)
- Chromospheric-Coronal Activity at Saturated Levels. Osmi Vilhu and Frederick M. Walter. **321**, 958, 135-A8 (1987)
- A Flare Event on the Long-Period RS Canum Venaticorum System IM Pegasi. Derek L. Buzasi, Lawrence W. Ramsey, and David P. Huenemoerder. **322**, 353, 141-F8 (1987)
- Absolute Oscillator Strengths for 108 Lines of Si I between 163 and 410 Nanometers. Peter L. Smith, M. C. E. Huber, G. P. Tozzi, H. E. Griessinger, B. L. Cardon, and G. G. Lombardi. **322**, 573, 144-B12 (1987)
- PG 1411 + 442: The Nearest Broad Absorption Line Quasar. Matthew A. Malkan, Richard F. Green, and John B. Hutchings. **322**, 729, 147-G6 (1987)
- The Ionization Structure of Planetary Nebulae. VII. New Observations of the Ring Nebula. Timothy Barker. **322**, 922, 150-A6 (1987)
- Ultraviolet Interstellar Extinction toward NGC 6530 and the Intrinsic Energy Distribution of 9 Sagittarii and HD 165052. Ana V. Torres. **322**, 949, 150-C7 (1987)
- Are There Stellar Winds in the Hot Stars of M31? J. B. Hutchings, Philip Massey, and L. Bianchi. **322**, L79, 152-B13 (1987)
- Microflares in the Solar Magnetic Network. J. G. Porter, R. L. Moore, E. J. Reichmann, E. Engvold, and K. L. Harvey. **323**, 380, 157-C5 (1987)
- IUE Observations of the Dwarf Nova HL Canis Majoris and the Winds of Cataclysmic Variables. Christopher W. Mauche and John C. Raymond. **323**, 690, 162-C6 (1987)
- The Progenitor of SN 1987A: Spatially Resolved Ultraviolet Spectroscopy of the Supernova Field. George Sonneborn, Bruce Altner, and Robert P. Kirshner. **323**, L35, 158-C7 (1987)
- The Copernicus Ultraviolet Spectral Atlas of Sirius. John B. Rogerson, Jr. **63**, 369, 6-A13 (1987) (Abstr. in **312**, 966, 13-E7)
- Ultraviolet Observations by the IUE of 31 Clusters of the Large Magellanic Cloud. A. Cassatella, J. Barbero, and E. H. Geyer. **64**, 83, 18-A7 (1987) (Abstr. in **314**, 832, 38-F8)
- Recurrent Episodic Mass Loss in a B2e Star: 66 Ophiuchi, 1982–1985. C. A. Grady, George Sonneborn, Chi-Chao Wu, and H. F. Henrichs. **65**, 673, 39-A2 (1987) (Abstr. in **322**, 1077, 151-G3)
- The Ultraviolet Spectrum of Beta Lyrae. Paolo A. Mazzali. **65**, 695, 39-D1 (1987) (Abstr. in **322**, 1077, 151-G3)

Wave Motions

- Resonance Absorption of Magnetohydrodynamic Surface Waves: Viscous Effects. Joseph V. Hollweg. **320**, 875, 119-D2 (1987)
- The Scattering of Alfvén Waves by Density Fluctuations. He-Sheng Li and Ellen G. Zweibel. **322**, 248, 140-E8 (1987)
- Nonlinear Magnetohydrodynamic Waves in a Steady Zonal Circulation for a Shallow Fluid Shell on the Surface of a Rotating Sphere. Y. Q. Lou. **322**, 862, 149-C4 (1987)
- Velocity Waves in 21 Centimeter Self-Absorption toward the Taurus Molecular Complex. W. L. H. Shuter, R. L. Dickman, and C. Klatt. **322**, L103, 152-D8 (1987)
- The α -Effect Generated by Random Alfvén Waves in a Stratified Atmosphere and Particle Acceleration. Tomikazu Namikawa, Hiromitsu Hamabata, and Hiroyuki Wada. **323**, 414, 157-F3 (1987)

X-Rays: Binaries

- Persistent Emission and Bursts from Aquila X-1 Observed by Einstein. M. Czerny, B. Czerny, and J. E. Grindlay. **312**, 122, 2-C13 (1987)
- A Search for Millisecond Periodic and Quasi-periodic Pulsations in Low-Mass X-Ray Binaries. S. Mereghetti and J. E. Grindlay. **312**, 727, 10-G6 (1987)
- Discovery of 5 Hz Quasi-periodic Oscillations in Cygnus X-2. J. P. Norris and K. S. Wood. **312**, 732, 11-A1 (1987)
- A 9.3 Hour Orbital Period in the Potential Black Hole Binary 4U 1957 + 11. John R. Thorstensen. **312**, 739, 11-A9 (1987)
- Search for Orbital X-Ray Variation in Scorpius X-1. W. C. Priedhorsky and S. S. Holt. **312**, 743, 11-A13 (1987)
- Compact X-Ray Binaries in Hierarchical Triples. I. Tidal Angular Momentum Loss and GX 17 + 2. Charles D. Bailyn and Jonathan E. Grindlay. **312**, 748, 11-B4 (1987)
- EXOSAT and Einstein Observations of the X-Ray Pulsar 4U 1145 + 619. S. Mereghetti, G. F. Bignami, P. A. Caraveo, and A. Goldwurm. **312**, 755, 11-B11 (1987)
- The Formation of Ultra-Short Period Binaries in Globular Clusters. Frank Verbunt. **312**, L23, 7-B9 (1987)
- Smearing of a Beaming Pattern by an Isotropic Cloud: An Analysis with Applications to Nonpulsing X-Ray Sources and Cosmic Rays. Y.-M. Wang and R. Schlickeiser. **313**, 200, 17-B11 (1987)
- X-Ray and Ultraviolet Radiation from Accreting White Dwarfs. IV. Two-Temperature Treatment with Electron Thermal Conduction. J. N. Imamura, R. H. Durisen, D. Q. Lamb, and G. J. West. **313**, 298, 18-B14 (1987)
- The Optical Light Curve of the Low-Mass X-Ray Binary XB 1254 – 690. Christian Motch, Holger Pedersen, Klaus Beuermann, Manfred W. Pakull, and Thierry J.-L. Courvoisier. **313**, 792, 25-D8 (1987)
- Correlation between Spectral State and Quasi-periodic Oscillation Parameters in GX 5–1. M. van der Klis, F. Jansen, J. van Paradijs, W. H. G. Lewin, M. Sztajno, and J. Trümper. **313**, L19, 21-B7 (1987)
- EXOSAT Observations of Double-peaked Bursts with Radius Expansion from 4U/MXB 1820 – 30. F. Haberl, L. Stella, N. E. White, W. C. Priedhorsky, and M. Gottwald. **314**, 266, 31-A9 (1987)
- Spectra and Pulse Profile of the Binary X-Ray Pulsar 4U 1538 – 52. K. Makishima, K. Koyama, S. Hayakawa, and F. Nagase. **314**, 619, 36-C10 (1987)
- Apsidal Advance in Vela X-1. J. E. Deeter, P. E. Boynton, F. K. Lamb, and G. Zylstra. **314**, 634, 36-E1 (1987)
- 1E 1048.5 + 5421: A New 114 Minute AM Herculis Binary. Simon L. Morris, Gary D. Schmidt, James Liebert, John Stocke, Isabella M. Gioia, and Tommaso Maccacaro. **314**, 641, 36-E8 (1987)
- Two Binary Cycles of GX 301 – 2. Richard E. Rothschild and Yang Soong. **315**, 154, 41-F6 (1987)

- Discovery of Three New RS Canum Venaticorum-like Counterparts to HEAO 1 X-Ray Sources. D. A. H. Buckley, I. R. Tuohy, R. A. Remillard, H. V. Bradt, and D. A. Schwartz. **315**, 273, 42-G14 (1987)
- The Discovery of 15–30 Hertz Quasi-periodic Oscillations in the X-Ray flux of 4U 1820 – 30. L. Stella, N. E. White, and W. Priedhorsky. **315**, L49, 45-E3 (1987)
- An 8.5 Hour X-Ray Period in the M15 X-Ray Source 4U 2129 + 12. Paul Hertz. **315**, L119, 49-D14 (1987)
- A New Soft X-Ray Mode in the AM Herculis Object E2003 + 225. Julian P. Osborne, Klaus Beuermann, Philip Charles, Laura Maraschi, Koji Mukai, and Aldo Treves. **315**, L123, 49-E5 (1987)
- The X-Ray Spectral Properties of the Bulge of M31. G. Fabbiano, G. Trinchieri, and L. S. Van Speybroeck. **316**, 127, 51-D1 (1987)
- High-Luminosity Accretion in Wind-driven Binary X-Ray Sources. Cheng Ho and Jonathan Arons. **316**, 283, 53-B3 (1987)
- Einstein Observations of EF Eridani (2A 0311 – 227), the Textbook Example of AM Herculis-type Systems. K. Beuermann, L. Stella, and J. Patterson. **316**, 360, 54-A6 (1987)
- Intensity and Source State Dependence of the Quasi-periodic Oscillations in Scorpius X-1. M. van der Klis, L. Stella, N. White, F. Jansen, and A. N. Parmar. **316**, 411, 54-F3 (1987)
- Compact X-Ray Binaries in Hierarchical Triples. II. Separation of the Inner Binary. Charles D. Bailyn. **317**, 737, 74-B3 (1987)
- Rapid Variability of P Cygni Lines in Massive X-Ray Binaries. Timothy R. Kallman, Richard McCray, and G. Mark Voit. **317**, 746, 74-B12 (1987)
- Effect of an Electron Scattering Cloud on X-Ray Oscillations Produced by Beaming. J. Brainerd and F. K. Lamb. **317**, L33, 71-C6 (1987)
- Massive Disk Formation from the Collision of a Main-Sequence Star with a White Dwarf in a Globular Cluster Core. Noam Soker, Oded Regev, Mario Livio, and Michael M. Shara. **318**, 760, 89-C4 (1987)
- Power Spectra of Quasi-periodic Oscillations in Luminous X-Ray Stars. N. Shibasaki and F. K. Lamb. **318**, 767, 89-C11 (1987)
- Reexamination of the SAS 2 Cygnus X-3 Data. C. E. Fichtel, D. J. Thompson, and R. C. Lamb. **319**, 362, 97-A9 (1987)
- Gamma-Ray Pulsar Model. Jeffrey M. Cohen and Errol Mustafa. **319**, 930, 105-B5 (1987)
- First Unambiguous X-Ray Detection of R Aquarii. R. Viotti, L. Piro, M. Friedjung, and A. Cassatella. **319**, L7, 100-A10 (1987)
- The Complex Cross-Spectra of Cygnus X-2 and GX 5-1. M. van der Klis, G. Hasinger, L. Stella, A. Langmeier, J. van Paradijs, and W. H. G. Lewin. **319**, L13, 100-B2 (1987)
- A Rapid Change of the Hercules X-1 Pulse Profile and High-State Duration. Yang Soong, Duane E. Gruher, and Richard E. Rothschild. **319**, L77, 107-E3 (1987)
- Kinematics and Age of the Low-Mass X-Ray Binaries. A. P. Cowley, J. B. Hutchings, David Crampton, and F. D. A. Hartwick. **320**, 296, 111-C11 (1987)
- Deterministic Chaos in Accreting Systems: Analysis of the X-Ray Variability of Hercules X-1. W. Voges, H. Atmanspacher, and H. Scheingraber. **320**, 794, 118-D10 (1987)
- Fluctuation of Wind-driven Accretion in X-Ray Binaries. Cheng Ho and Jonathan Arons. **321**, 404, 126-E11 (1987)
- The Discovery of 7 and 24–28 Hertz Quasi-periodic Oscillations in the X-Ray Flux of GX 17 + 2 (4U 1812 – 14). L. Stella, A. N. Parmar, and N. E. White. **321**, 418, 126-F11 (1987)
- The Primary Orbit and Absorption Lines of HDE 226868 (Cygnus X-1). Z. Ninkov, G. A. H. Walker, and S. Yang. **321**, 425, 126-G4 (1987)
- The He II λ 4686 and H α Emission Lines of Cygnus X-1. Z. Ninkov, G. A. H. Walker, and S. Yang. **321**, 438, 127-A3 (1987)
- CAL 83: A Puzzling X-Ray Source in the Large Magellanic Cloud. David Crampton, A. P. Cowley, J. B. Hutchings, Paul C. Schmidtke, I. B. Thompson, and James Liebert. **321**, 745, 132-F3 (1987)
- The Low-Luminosity X-Ray Sources in Omega Centauri. Bruce Margon and Michael Bolte. **321**, L61, 129-F11 (1987)
- Long-Term Gamma-Ray Spectral Variability of Cygnus X-1. J. C. Ling, W. A. Mahoney, Wm. A. Wheaton, and A. S. Jacobson. **321**, L117, 137-B8 (1987)
- X-Ray Irradiated Accretion Disks and Bimodal States. H. Inoue and R. Hoshi. **322**, 320, 141-C11 (1987)
- The High-Energy X-Ray Spectrum of Black Hole Candidate GX 339 – 4 during a Transition. J. F. Dolan, C. J. Crannell, B. R. Dennis, and L. E. Orwig. **322**, 324, 141-D1 (1987)
- The Spectra of Accretion Disks and Their Application to Low-Mass X-Ray Binaries. Ronald E. Taam and P. Mészáros. **322**, 329, 141-D6 (1987)
- Search for X-Ray Emission from the Radio Lobes of Scorpius X-1. Barry Geldzahler and Paul Hertz. **322**, 342, 141-E5 (1987)
- The Effect of Decay of the Amplitude of Oscillation on Random Process Models for QPO X-Ray Stars. N. Shibasaki, R. F. Elsner, and M. C. Weisskopf. **322**, 831, 149-A1 (1987)
- The Evolutionary Status of 4U 1820 – 30. S. Rappaport, L. A. Nelson, C. P. Ma, and P. C. Joss. **322**, 842, 149-A12 (1987)
- EXOSAT Observations of 4U 1705 – 44: Type I Bursts and Persistent Emission. A. Langmeier, M. Sztajno, G. Hasinger, J. Trümper, and M. Gottwald. **323**, 288, 156-B13 (1987)
- On the Stability of the 13.2 Minute Oscillation of V1223 Sagittarii. F. Jablonski and J. E. Steiner. **323**, 672, 162-B2 (1987)
- Effects of Electron Scattering on the Oscillations of an X-Ray Source. Nikolaos D. Kylafis and George S. Klimis. **323**, 678, 162-B8 (1987)
- Sporadic and Periodic 10–1000 TeV Gamma Rays From Cygnus X-3. R. M. Baltrusaitis, G. L. Cassiday, R. Cooper, B. R. Dawson, J. W. Elbert, B. E. Fick, P. R. Gerhardt, K. D. Green, D. F. Liebing, C. P. Lingle, E. C. Loh, P. Sokolsky, P. Sommers, and D. Steck. **323**, 685, 162-C1 (1987)
- X-Rays: Bursts**
- Persistent Emission and Bursts from Aquila X-1 Observed by Einstein. M. Czerny, B. Czerny, and J. E. Grindlay. **312**, 122, 2-C13 (1987)
- Quasi-static Winds from Neutron Stars. Paul C. Joss and Fulvio Melia. **312**, 700, 10-E7 (1987)
- EXOSAT and Einstein Observations of the X-Ray Pulsar 4U 1145 – 619. S. Mereghetti, G. F. Bignami, P. A. Caraveo, and A. Goldwurm. **312**, 755, 11-B11 (1987)
- Discovery of an X-Ray Burst from 4U 2129 + 47. Michael R. Garcia and Jonathan E. Grindlay. **313**, L59, 27-C1 (1987)
- EXOSAT Observations of Double-peaked Bursts with Radius Expansion from 4U/MXB 1820 – 30. F. Haberl, L. Stella, N. E. White, W. C. Priedhorsky, and M. Gottwald. **314**, 266, 31-A9 (1987)
- Time-dependent Calculations of X-Ray and γ Reprocessing. Lynn R. Cominsky, Richard A. London, and Richard I. Klein. **315**, 162, 41-F14 (1987)
- Thermal Evolution of Accreting Neutron Stars. II. Long X-Ray Bursts as a Probe Into the Interior. Masayuki Y. Fujimoto, Tomoyuki Hanawa, Icko Iben, Jr., and Martin B. Richardson. **315**, 198, 42-B9 (1987)
- Multipeaked X-Ray Bursts from 4U/MXB 1636 – 53: Evidence for Burst-induced Accretion Disk Coronae. Fulvio Melia. **315**, L43, 45-D12 (1987)
- The Discovery of 15–30 Hertz Quasi-periodic Oscillations in the X-Ray flux of 4U 1820 – 30. L. Stella, N. E. White, and W. Priedhorsky. **315**, L49, 45-E3 (1987)
- S-Matrix Calculation of the Triple-Alpha Reaction. Ikko Fushiki and D. Q. Lamb. **317**, 368, 68-A1 (1987)
- Nonradial g-Mode Oscillations in X-Ray Bursting Neutron Stars. P. N. McDermott and Ronald E. Taam. **318**, 278, 82-A1 (1987)
- EXOSAT Observations of 4U/MXB 1636 – 53: On the Relation between the Amount of Accreted Fuel and the Strength of an X-Ray Burst. W. H. G. Lewin, W. Penninx, J. van Paradijs, E. Damen, M. Sztajno, J. Trümper, and M. van der Klis. **319**, 893, 104-F9 (1987)
- On the Theory of Type I X-Ray Bursts. The Energetics of Bursts and the Nuclear Fuel Reservoir in the Envelope. Masayuki Y. Fujimoto, Mirek Sztajno, Walter H. G. Lewin, and Jan van Paradijs. **319**, 902, 104-G5 (1987)
- Rapid Optical Flaring in MXB 1735 – 444 and an Optical Burst from GX 17 + 2. James N. Imamura, Thomas Y. Steiman-Cameron, and John Middleditch. **320**, L41, 114-D3 (1987)
- Localization, Time Histories, and Energy Spectra of a New Type of Recurrent High-Energy Transient Source. J.-L. Atteia, M. Boer, K. Hurley, M. Niel, G. Vedrenne, E. E. Fenimore, R. W. Klebesadel, J. G. Laros, A. V. Kuznetsov, R. A. Sunyaev, O. V. Terekhov, C. Koweliout, T. Cline, B. Dennis, U. Desai, and L. Orwig. **320**, L105, 121-C7 (1987)
- Multipeaked X-Ray Bursts from 4U/MXB 1636 – 53: Evidence against Burst-induced Accretion Disk Coronae. W. Penninx, J. van Paradijs, and W. H. G. Lewin. **321**, L67, 129-G4 (1987)
- EXOSAT Observations of 4U 1705 – 44: Type I Bursts and Persistent Emission. A. Langmeier, M. Sztajno, G. Hasinger, J. Trümper, and M. Gottwald. **323**, 288, 156-B13 (1987)
- The Properties of Bursts with Short Recurrence Times from the Transient X-Ray Source EXO 0748 – 676. M. Gottwald, F. Haberl, A. N. Parmar, and N. E. White. **323**, 575, 161-A11 (1987)
- Model Atmospheres of Near-Eddington Limit X-Ray Bursters. Arif Babul and Bohdan Paczyński. **323**, 582, 161-B5 (1987)
- New Insights from a Global View of X-Ray Bursts. Ikko Fushiki and D. Q. Lamb. **323**, L55, 158-D10 (1987)
- On the Radius of Neutron Stars. P. Mészáros and H. Riffert. **323**, L127, 164-D3 (1987)
- X-Rays: General**
- Time-dependent Calculations of X-Ray and γ Reprocessing. Lynn R. Cominsky, Richard A. London, and Richard I. Klein. **315**, 162, 41-F14 (1987)

X-Rays: General—Continued

- Long-Term Gamma-Ray Spectral Variability of Cygnus X-1. J. C. Ling, W. A. Mahoney, Wm. A. Wheaton, and A. S. Jacobson. **321**, L117, 137-B8 (1987)
- Effects of Electron Scattering on the Oscillations of an X-Ray Source. Nikolaos D. Kylafis and George S. Klimis. **323**, 678, 162-B8 (1987)

X-Rays: Sources

- Persistent Emission and Bursts from Aquila X-1 Observed by Einstein. M. Czerny, B. Czerny, and J. E. Grindlay. **312**, 122, 2-C13 (1987)
- Observations of Soft X-Ray Spectra from a Seyfert 1 and a Narrow Emission-Line Galaxy: Erratum. K. P. Singh, G. P. Garmire, and J. Nousek. **312**, 484, 6-B10 (1987) (Orig. paper in **297**, 633, 108-D10)
- Imaging Spectroscopy of Five QSOs. Paul Hickson and J. B. Hutchings. **312**, 518, 8-E6 (1987)
- The Discovery of a Second Orbital Period from the X-Ray Source 4U 1820 - 30 in the Globular Cluster NGC 6624. L. Stella, W. Priedhorsky, and N. E. White. **312**, L17, 7-B4 (1987)
- A Hard X-Ray Source in the Nearest Molecular Cloud. J. P. Halpern and J. Patterson. **312**, L31, 7-C2 (1987)
- X-Ray Background, Discrete Sources, and Diffuse Processes. Riccardo Giacconi and Giovanni Zamorani. **313**, 20, 15-B12 (1987)
- X-Ray Emission Associated with the Jet in 3C 273. D. E. Harris and C. P. Stern. **313**, 136, 16-D14 (1987)
- A 9 Month Long Soft X-Ray Survey of the Large Magellanic Cloud. I. X-Ray Map at $\frac{1}{2}$ keV. K. P. Singh, J. A. Nousek, D. N. Burrows, and G. P. Garmire. **313**, 185, 17-A7 (1987)
- Resolution of the Discrepancy between the X-Ray Background Spectrum and That of Discrete Sources. I. E. Segal. **313**, 543, 22-F7 (1987)
- X-Ray Radiation from the Intergalactic Plasma. Xavier Barcons. **313**, 547, 22-F11 (1987)
- X-Ray Studies of Quasars with the EINSTEIN OBSERVATORY. IV. X-Ray Dependence on Radio Emission. D. M. Worrall, P. Giommi, H. Tananbaum, and G. Zamorani. **313**, 596, 23-C9 (1987)
- The X-Ray Emission from Gamma-Ray Burst Sources: Constraints on Theoretical Models. James N. Imamura and Richard I. Epstein. **313**, 711, 24-E6 (1987)
- Discovery of an X-Ray Burst from 4U 2129 + 47. Michael R. Garcia and Jonathan E. Grindlay. **313**, L59, 27-C1 (1987)
- X-Ray Studies of the Supernova Remnant N132D. I. Morphology. John P. Hughes. **314**, 103, 29-B6 (1987)
- The X-Ray Properties of High-Redshift Quasi-stellar Objects. Scott F. Anderson and Bruce Margon. **314**, 111, 29-B14 (1987)
- An Upper Limit on the Flux of Extraterrestrial Neutrinos. R. Svoboda, R. M. Bionta, G. Blewitt, C. B. Bratton, D. Casper, P. Chrysocoulou, A. Ciofio, R. Claus, B. Cortez, S. T. Dye, S. Errede, G. W. Foster, W. Gajewski, K. S. Ganezer, M. Goldhaber, T. J. Haines, T. W. Jones, D. Kielczewska, W. R. Kropp, J. G. Learned, J. M. LoSecco, J. Matthews, H. S. Park, R. Reines, J. Schultz, S. Seidel, E. Shumard, D. Sinclair, H. W. Sobel, J. L. Stone, L. Sulak, G. Thornton, J. C. van der Velde, and C. Wuest. **315**, 420, 45-C10 (1987)
- X-Ray-Selected AGNs near Bright Galaxies. John T. Stocke, Peter Schneider, Simon L. Morris, Isabella M. Gioia, Tommaso Maccacaro, and Rudolph E. Schild. **315**, L11, 45-A14 (1987)
- An 8.5 Hour X-Ray Period in the M15 X-Ray Source 4U 2129 + 12. Paul Hertz. **315**, L119, 49-D14 (1987)
- A New Soft X-Ray Mode in the AM Herculis Object E2003 + 225. Julian P. Osborne, Klaus Beuermann, Philip Charles, Laura Maraschi, Koji Mukai, and Aldo Treves. **315**, L123, 49-E5 (1987)
- Deep Einstein X-Ray Imagery of the Small Magellanic Cloud. Frederick C. Bruhweiler, Daniel A. Klingensmith III, Theodore R. Gull, and Sabatino Sofia. **317**, 152, 65-E11 (1987)
- Inside Supernova 1987A. Richard McCray, J. Michael Shull, and Peter Sutherland. **317**, L73, 78-C7 (1987)
- The Origin of the Diffuse X-Ray Background. T. T. Hamilton and D. J. Helfand. **318**, 93, 80-A1 (1987)
- Luminosity Dependence in the Ratio of X-Ray to Infrared Emission of QSOs. D. M. Worrall. **318**, 188, 81-A4 (1987)
- Absorption Features from the Accretion Column in E1405 - 451. D. T. Wickramasinghe, I. R. Tuohy, and N. Visvanathan. **318**, 326, 82-D8 (1987)
- The Spatial Distribution and Population of Novae in M31. Robin Ciardullo, Holland C. Ford, James D. Neill, George H. Jacoby, and Allen W. Shafter. **318**, 520, 86-E6 (1987)
- Use of a Minimum Rate of Change Formalism to Quantify Variability of Extragalactic X-Ray Sources. Daniel A. Schwartz. **318**, 568, 87-B7 (1987)
- Star Formation in X-Ray Cluster Cooling Flows. Raymond E. White III and Craig L. Sarazin. **318**, 612, 87-E9 (1987)
- Determining Star Formation Rates in X-Ray Cluster Cooling Flows. Raymond E. White III and Craig L. Sarazin. **318**, 621, 87-F5 (1987)

Numerical Models of Star Formation in X-Ray Cluster Cooling Flows.

- Raymond E. White III and Craig L. Sarazin. **318**, 629, 87-F14 (1987)
- A Deep Optical Study of the Field of 1E 0630 + 178. G. F. Bignami, P. A. Caraveo, J. A. Paul, L. Salotti, and L. Vigroux. **319**, 358, 97-A1 (1987)
- A Scanning Modulation Collimator Observation of the High Energy X-Ray Source in the Crab Nebula. R. M. Pelling, W. S. Paciesas, L. E. Peterson, K. Makishima, M. Oda, Y. Ogawara, and S. Miyamoto. **319**, 416, 97-F7 (1987)
- A Rapid Change of the Hercules X-1 Pulse Profile and High-State Duration. Yang Soong, Duane E. Gruber, and Richard E. Rothschild. **319**, L77, 107-E3 (1987)
- IRAS Observations of Supernova Remnants: A Comparison between Their Infrared and X-Ray Cooling Rates. Eli Dwek, Robert Petre, Andrew Szymkowiak, and Walter L. Rice. **320**, 27, 114-C4 (1987)
- Coherence Effects on Quasi-periodic Oscillations from Galactic X-Ray Sources. R. F. Elsner, N. Shibasaki, and M. C. Weisskopf. **320**, 527, 115-C8 (1987)
- Rapid Optical Flaring in MXB 1735 - 444 and an Optical Burst from GX 17 + 2. James N. Imamura, Thomas Y. Steiman-Cameron, and John Middleditch. **320**, L41, 114-D3 (1987)
- Time Variability of Gamma Cassiopeiae in X-Rays. F. Frontera, D. Dal Fiume, N. R. Robba, G. Manzo, S. Re, and E. Costa. **320**, L127, 121-D13 (1987)
- The Discovery of 7 and 24-28 Hertz Quasi-periodic Oscillations in the X-Ray Flux of GX 17 + 2 (4U 1812 - 14). L. Stella, A. N. Parmar, and N. E. White. **321**, 418, 126-F11 (1987)
- The Low-Luminosity X-Ray Sources in Omega Centauri. Bruce Margon and Michael Bolte. **321**, L61, 129-F11 (1987)
- Long-Term Gamma-Ray Spectral Variability of Cygnus X-1. J. C. Ling, W. A. Mahoney, Wm. A. Wheaton, and A. S. Jacobson. **321**, L117, 137-B8 (1987)
- The Origin of the Diffuse X-Ray Background and the Formation of Galaxies and Voids. Ruth A. Daly. **322**, 20, 138-B12 (1987)
- X-Ray Observations of the Supernova Remnant N103B in the Large Magellanic Cloud. K. P. Singh, N. J. Westergaard, H. W. Schnopper, and D. J. Helfand. **322**, 80, 138-G3 (1987)
- Diffuse Einstein X-Ray Emission from the Region of RCW 49, a Bright Southern Emission Nebula. A. Goldwurm, P. A. Caraveo, and G. F. Bignami. **322**, 349, 141-E12 (1987)
- X-Ray and Optical Observations of X-Ray-Selected BL Lacertae Objects. P. Giommi, P. Barr, B. Garilli, I. M. Gioia, T. Maccacaro, D. Maccagni, and R. E. Schild. **322**, 662, 146-A10 (1987)
- Einstein IPC Imaging and Spectral Observations of the Supernova Remnant HB 9. D. A. Leahy. **322**, 917, 150-A1 (1987)
- Constraints on Possible Precursor AGN Sources of the Cosmic X-Ray Background. Elihu Boldt and Darryl Leiter. **322**, L1, 145-A4 (1987)
- X-Rays: Spectra**
- Observations of Soft X-Ray Spectra from a Seyfert 1 and a Narrow Emission-Line Galaxy: Erratum. K. P. Singh, G. P. Garmire, and J. Nousek. **312**, 484, 6-B10 (1987) (Orig. paper in **297**, 633, 108-D10)
- X-Ray Background, Discrete Sources, and Diffuse Processes. Riccardo Giacconi and Giovanni Zamorani. **313**, 20, 15-B12 (1987)
- Resolution of the Discrepancy between the X-Ray Background Spectrum and That of Discrete Sources. I. E. Segal. **313**, 543, 22-F7 (1987)
- Spectra and Pulse Period of the Binary X-Ray Pulsar 4U 1538 - 52. K. Makishima, K. Koyama, S. Hayakawa, and F. Nagase. **314**, 619, 36-C10 (1987)
- X-Ray Spectra of PG Quasars. II. The X-Ray-Ultraviolet Excess of PG 1211 + 143. Jill Bechtold, Bozena Czerny, Martin Elvis, G. Fabbiano, and Richard F. Green. **314**, 699, 37-C5 (1987)
- X-Ray Observations of Spiral Galaxies. II. Images and Spectral Parameters of 13 Galaxies. G. Fabbiano and G. Trinchieri. **315**, 46, 40-D11 (1987)
- Two Binary Cycles of GX 301 - 2. Richard E. Rothschild and Yang Soong. **315**, 154, 41-F6 (1987)
- The X-Ray Spectrum of NGC 1068. R. Monier and J. P. Halpern. **315**, L17, 45-B6 (1987)
- The X-Ray Spectral Properties of the Bulge of M31. G. Fabbiano, G. Trinchieri, and L. S. Van Speybroeck. **316**, 127, 51-D1 (1987)
- The X-Ray Spectrum of Markarian 509 Observed by EXOSAT. M. Morini, N. A. Lipani, and D. Molteni. **317**, 145, 65-E3 (1987)
- Observation of Nonthermal Energy Distributions during the Impulsive Phase of Solar Flares. J. F. Seely, U. Feldman, and G. A. Doschek. **319**, 541, 99-B9 (1987)
- A Nonthermal Model for the XUV, Soft X-Ray Emission of AGN and QSOs. T. W. Jones and W. A. Stein. **320**, L1, 114-A4 (1987)
- Fe K Features as Probes of the Nuclear Reflection Region in Seyfert Galaxies. Julian H. Krolik and Timothy R. Kallman. **320**, L5, 114-A8 (1987)

- Is Optical Fe II Emission Related to the Soft X-Ray Properties of Quasars? *Belinda J. Wilkes, Martin Elvis, and Ian McHardy.* **321**, L23, 129-C12 (1987)
- Long-Term Gamma-Ray Spectral Variability of Cygnus X-1. *J. C. Ling, W. A. Mahoney, Wm. A. Wheaton, and A. S. Jacobson.* **321**, L117, 137-B8 (1987)
- X-Ray Observations of the Supernova Remnant N103B in the Large Magellanic Cloud. *K. P. Singh, N. J. Westergaard, H. W. Schnopper, and D. J. Helfand.* **322**, 80, 138-G3 (1987)
- The High-Energy X-Ray Spectrum of Black Hole Candidate GX 339 - 4 during a Transition. *J. F. Dolan, C. J. Crannell, B. R. Dennis, and L. E. Orwig.* **322**, 324, 141-D1 (1987)
- Properties of Solar Coronal Active Regions Deduced from X-Ray Line Spectra. *D. L. McKenzie.* **322**, 512, 143-E5 (1987)
- X-Ray and Optical Observations of X-Ray-Selected BL Lacertae Objects. *P. Giommi, P. Barr, B. Garilli, I. M. Gioia, T. Maccacaro, D. Maccagni, and R. E. Schild.* **322**, 662, 146-A10 (1987)
- Quasar Energy Distributions. I. Soft X-Ray Spectra of Quasars. *Belinda J. Wilkes and Martin Elvis.* **323**, 243, 155-F5 (1987)

Zodiacal Light

- Inversion of the Zodiacal Infrared Brightness Integral. *S. S. Hong and I. K. Um.* **320**, 928, 120-A5 (1987)

L

2

3

7

I

